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From circus acts to violent clowns: The parasite as performer

ABSTRACT

With the growing awareness of the contribution of parasites to life, their influences on humans also become clearer. The parasite's footprints can be seen everywhere, in genetics, epidemiology, medicine, history and, as this article clarifies, parasites play a vivid part in our cultural imagination surrounding popular entertainment. Drawing and expanding on Michel Serres' and Enid Welsford's discussions of the parasite as a cultural force, this article explores the line of filiation and interplay between biological parasites, circus arts and their comic emblem, the clown, in different narratives and media. It documents not only fantasies of a collaborative relationship between flea performers and their 'masters', and of the relationship between clowns and parasites, both of which are mischievous 'characters', but also circus-related imaginaries of parasitic remote control.

KEYWORDS

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Few things have a reputation worse than that of parasites and parasitism. Biologically, parasitism describes the 'relationship between species, where one organism (parasite) lives on or in another organism (host), causing it some harm, and is adapted structurally to this way of life' (Poulin 2007: 4–5). Until recently, parasites were viewed, even by many biologists, as degenerate, a threat to other species or whole ecosystems (cf. Holmes 1996), and a cul-de-sac of evolution (cf. Jackson 2015: 142). The appearance of parasites was seen as a

sign of disequilibrium in the health of an animal or in an ecological community. The observation of parasites caused none other than Charles Darwin to question the presence of God and prompted him to famously remark:

There seems to me too much misery in the world. I cannot persuade myself that a beneficent & omnipotent God would have designedly created the *Ichneumonidæ* [a parasitic wasp] with the express intention of their feeding within the living bodies of caterpillars

(letter to Asa Gray, 22 May 1860)

The seemingly sudden appearance of parasites (due to complex life cycles), the devastating effect they have on their hosts and their unusual morphology (the result of efficient adaptation to their host's lifestyle) all make it easy to brand them as evil and dangerous entities that are sabotaging life.

In fiction and popular culture, parasitic characters frequently appear as a metaphor for the threat and spread of parasitic disease (cf. Taylor-Brown on *Dracula*, 2015: 17–18). Recently, infiltrating human bodies, transforming them into monsters, to ultimately destroy us, parasites have prominently featured in the *Prometheus* and *Alien* sagas, in which they act as extraterrestrial biological weapons. Parasites also appear in eco-horror scenarios introducing us to the result of environmentally destructive behaviours of the human host through the cataclysmic rise of dormant antediluvian and toxicity-born man-made parasites (cf. Murray and Heumann 2016). Thus, the quintessential parasite narrative seems to showcase its protagonist as a somatic, psychological, social threat, *representing* and *becoming* a monstrosity that embodies both anxieties about the robustness of human identity, its usurpation and the fantasy of the taming of the parasite (cf. Grant 2013).

Exploring the cultural force of the parasite within the context of popular entertainment, this study participates in and feeds into an emerging parasitological discourse exploring the many *positive* aspects of parasites. Some estimate that close to half (if not more) of all living species have adopted a parasitic lifestyle (Dobson et al. 2008). Further studies shed new light on parasites by drawing attention to their importance in the stability of ecosystems (Combes 1996), their contribution to biodiversity (Carlson et al. 2017) or their role as agents that ensure the proper maturation and functioning of the human immune system (Tyagi et al. 2015). A better understanding of parasites has significantly increased our appreciation of them and has extended the exploitation of parasites beyond the traditional use of leeches for their anti-coagulant effect: hookworms, for example, are now being investigated for their potential to treat autoimmune or inflammatory conditions like coeliac disease (Wangchuk et al. 2019), and parasitoid wasps are used in sustainable agriculture to fight aphids (Bianchi et al. 2006).

Although non-threatening behaviours of parasites have been studied before (cf. Taylor-Brown 2014, 2015; Shigemi 2002), there is a dearth of research with respect to their role and *comic* dimensions within the context of popular entertainment forms, namely the circus, in different media. Evidently, parasites have been performing in flea circuses for centuries, but what are the cultural narratives emerging from these appearances (for instance from the relationship between flea 'trainer' and performer)? What kind of cultural work does the parasite do in circus contexts? What kind of aesthetic achievements does it make possible? What parasites, and based on what characteristics, have produced *comic* cultural fantasies? This article aims to find out by examining

two networks of meaning: fantasies of a collaborative relationship between flea performers and their 'masters' in circus contexts, and fantasies of the clown-parasite relationship. As we will uncover by discussing two contemporary 'case studies', clowns and parasites are linked through their mischievous character, prone to interfere with others, and through what can be called parasitic dressage – circus-related imaginaries of parasitic remote control. Selected because they are typologically pervasive and accessible, and foundational for contemporary versions of (comic) parasitic characters, and also because they inflect audience expectations and inform the patterns of future texts, these examples form a mosaic of texts and ideas that offers a colourful, suggestive picture of the manifold roles of the parasite in circus and clown contexts, and elucidates contemporary discourse by shedding historical light on some of its foundations.

Tying a 'dizzying array of registers' together in his book *The Parasite* (first published in 1980), 'a loosely knit tapestry of knowledges and disciplines' (Wolfe 2007: xi), French philosopher Michel Serres is one of the pioneers in expanding the biological concept of parasitism and applying it in a cultural context. He uses the parasite as a theoretical model for understanding hard sciences and human sciences, and for gaining insight into the social, the natural and the systemic network of interrelations, especially human relations. For Serres, the parasitic relation is a primordial, one-way relation and the base of human institutions, society and history. He explores the three distinct meanings of the French word *parasite* – social parasite (sycophant), biological parasite (tapeworms, etc.) and 'noise' or 'interference', generally within a channel of communication – in fable, history, philosophy and science, and carves out the productive and creative dimensions of the parasite as disturber and disorder-maker (cf. Serres 2007). Through invading and occupying other organisms, the parasite's position is to 'be between'; and it infuses their respective systems with a new order: 'The parasite intervenes, enters the system as an element of fluctuation. It excites it or incites it; it puts it into motion, or it paralyzes it. It changes its state, changes its energetic state, its displacements and condensation' (Serres 2007: 191). These are some of the storylines that parasite tales develop: stories of externally (or internally) determined change, unintentional incorporation, but also of cheating, as Serres highlights by discussing Molière's *Tartuffe*, 'the canonic example and the excellent model of the parasite' (2007: 201). To avoid rejection and exclusion, a (biological) parasite

makes or secretes tissue identical to that of its host at the location of contact points with the host's body [...]. The parasite plays a game of mimicry. It does not play at being another; it plays at being the same.
(Serres 2007: 202)

– or it transforms its 'host' into the same, that is, into 'itself'. However, apart from examining Molière's comedy *Tartuffe*, Serres only mentions some vague links of the parasite to the (comic) performance world. This article will expand on this connection by delving deeper into the cultural world of parasites.

UNDER THE BIG TOP AND BEYOND

Biting is the main condition of my being, that's just the way it is, but I always bite at the right time and in the right place.
(Hoffmann 1946: 495; translation ASJ)

There are live fleas. There are dead fleas artfully arranged. And there's the unidentifiable something the viewer brings to the performer.

(Keifetz 2012: 51)

In circus contexts, parasites most prominently and enduringly appear as flea circus performers.

Flea bites cause not only intense itching and anaemia, but fleas themselves can also transmit other disease-causing organisms. Fleas, which form the order of Siphonaptera, are tiny flightless insects – 1 mg in weight and 1 mm in height – but display extraordinary skills: their reproductive potential allows one female to produce 20,000 fleas in two months, and their legs allow them to jump 150 times their heights and pull 5000 times their own weight – the equivalent of a human pulling a Jumbo Jet. Louis Bertolotto successfully added a new dimension to these 'sleep-depriving, bump-erecting, feathery-tickling, night-and-day-itching, lunacy-inducing powers of the pestilential, omnipresent flea' (Lehane 1969: 25): the power to perform.

According to fleaologist Brendan Lehane, Bertolotto's 'extraordinary exhibition of industrious fleas' from the early 1820s is the first recorded flea circus (Bertolotto in Lawton 2012: 53). It featured a twelve-piece flea orchestra playing audible flea music, a Great Mogul Flea (with harem), a ballroom with flea ladies and frock-coated gentlemen dancing a waltz, a mail coach drawn by four fleas (with an actually cracking whip) and a re-enactment of the Battle of Waterloo including Wellington, Napoleon and field marshal Blücher – all played by miniature warrior fleas (cf. Lawton 2012; Lehane 1969: 60). Bertolotto's shows highlighted the craftsmanship of the prop maker, often clock makers or blacksmiths, but also creatively focused on the fleas' performance. Thanks to 'imaginatively devised extensions' of the fleas' natural actions, the genre flourished until well into the twentieth century (cf. Nickell 2005: 317), which, interestingly, coincided with the time (around 1900) when parasitology was gaining its professional status and needed to be legitimized as an emerging field of research (cf. Taylor-Brown 2014: 63). Trick fleas did not only perform in P.T. Barnum's American Museum but also in Hubert's Museum in New York, presented by 'Professor' Roy Heckler, who, beginning in the 1930s, became one of the most celebrated flea circus ringmasters in the United States for some three decades (cf. Chemers 2004:21; Nickell 2005: 316; for a caricature of Barnum as 'Hum-Bug' see Toll 1976: 26). Another famous twentieth-century flea impresario, Professor Len Tomlin ('the prefix is traditional, if not academic'), presented a ballet act, a tightrope walk, a roundabout and a chariot procession (Lehane 1969: 62). Flea performances of this kind always had been the subject of disbelief and deceptions as 'showmen have been known to exhibit preserved fleas cleverly affixed to apparatus or, indeed, to present shows with no fleas at all' (Nickell 2005: 315).

Today, traditional flea circuses can still be found, for instance *Flohziirkus Birk* has been an integral part of the infamous Oktoberfest in Munich for decades (see *Flohziirkus Birk Official Website*; cf. Maria Fernanda Cardoso *Official Website*), as can contemporary re-interpretations. Premiered in 2009 and still running, performing fleas most dramatically appear in the Cirque du Soleil show *Ovo* – a wild world of fantastically costumed 'fun-loving insects'. Amongst that 'community with hundreds of open arms', a gang of jumping fleas features in a trampoline act. 'THESE fleas', the programme booklet emphatically states, 'are just itching to be airborne, too! Combining elements of dance, acrobatics, athleticism and sheer agility, these colourful fleas fling

themselves through space and come together in graceful, perfectly balanced sculptural formations' (Cirque du Soleil 2018).

Graceful flea circus performers do not only present their agility onstage. Presentations of and stories about midget anthropophagi were so popular in the past that there is even a literary genre (especially in the German-speaking world) called 'Flea Fiction'. In these texts, fleas feature in various curious perspectives. The genre includes flea-porn, such as *The Autobiography of a Flea* (published anonymously in 1887; for a discussion of erotic flea animalographies, see Prystash 2016; cf. Lehane 1969), and texts in which the flea appears as a performer such as Hans Christian Andersen's novella *The Flea and the Professor* from 1873, in which an aeronaut, called 'Professor', and his six-legged performing prodigy travel to 'the land of the wild men'. There indeed, as the professor knew, they eat Christian persons; but he wasn't a proper Christian and the flea wasn't a proper person, and so he thought they might safely go there and earn good money' (1960: 405), which they do. Although the flea's tricks are popular and its life and that of the professor amongst the cannibals are pleasant, the two soon get bored. This is why the professor builds a balloon, in which they escape and return home, where 'they are prosperous and respected people, the flea and the professor!' (Andersen 1960: 409).

Another famous, fanciful fictional flea text featuring a flea-performer is E. T. A. Hoffmann's knotty fairy-tale novel *Meister Floh* ('Master Flea') from 1822. In this text, flea taming for entertainment purposes is called the 'strangest art' and 'droll artistry' and is supposed to cultivate the little animals, or at least this is how the protagonist perceives flea performances before meeting Master Flea. Master Flea (whose masterdom remains a mystery) is the head of a flea troupe (distinguished by 'amazing aplomb') and a man [*sic!*] of the most extensive erudition. He is a scion from the 'strangest, incomprehensible magic kingdom' who has deepest experience in all branches of knowledge and argues that humans should never measure the spiritual mass of reason by bodily extension (Hoffmann 1946: 358, 359, 384, 442; all translation by ASJ). According to Master Flea, his highly cultivated people are superior to humans when it comes to the understanding of the secrets of nature, strength and corporal and intellectual agility. But unfortunately they were enslaved into show business, had to wear weapons, carry canons. Others were forced to become statesmen, warlords and, most unbelievably, professors (1946: 384). *Meister Floh* and *The Flea and the Professor* are not only science satires; they also take the (flea) circus' promise to bring about previously unseen feats, acts and creatures *ad absurdum*. In both flea texts, domesticated parasites do not cause physical harm or infect their hosts with dangerous diseases; in fact, their irreverent eating habits are hardly mentioned. Instead, they collaborate with their impresarios with whom they live in mutualistic symbiosis. In contrast to his non-literary counterparts, Master Flea's analeptic bites increase the flow of blood and make a previously frail person bloom again (Hoffmann 1946: 387).

A similarly productive cooperation between a tame(d) flea and his ring-master features in the 1995 movie *City of Lost Children*, a science fantasy drama by Marc Caro and Jean-Pierre Jeunet, in which a Siphonaptera is trained to *inject* a toxic substance. This minuscule action triggers an unexpected chain of events. In accordance with Michel Serres' theory of the parasite, we can say that a tiny difference is followed by immense catastrophic effects (2007: 194). Once plunged under the skin of a person selected by flea trainer Marcello, the poison makes that person murder the next passer-by. Marcello's flea

appears three times in the movie and each time changes the course of events dramatically, which is why Chris Chang argues that the moral of the movie is to 'take care of the little things or they will destroy you' (1995: 9). A main target of the flea is a pair of vicious Siamese Twin sisters. These conjoined sisters – who once performed in Marcello's show and turned out to be evil – are reminiscent of a parasite themselves as they live off the valuables that they force children to steal for them.

In historical circus contexts, the term 'parasitic' had a specific connotation with respect to Siamese Twins, as they represent a different version of the coexistence of two identities in one body (cf. Shigemi 2002: 133; Vallgren 2002: 93). Around 1900, when circuses consisted of monumental productions with opulent mechanics and huge menageries, Siamese Twins were exhibited in so-called 'Freakshows', the 'formally organized exhibition of people with alleged and real physical, mental, or behavioral anomalies for amusement and profit' (Bogdan 1988: 10). Freakshows staged physical particularities that were necessarily captivating and, ideally, shocking, including skin diseases such as pigment disorders and hyperkeratosis, and other syndromes and genetic deformities. Amongst the most popular freak performers were 'parasitic twins': people with an incompletely formed, unequal or asymmetrical twin joined to their body, and whose bodily functions were completely dependent on the other twin. This is why, using the biological term in a warped way, they are defined as parasitic. A famous performer who entertained her audiences with an underformed, atrophic, parasitic twin was Myrtle Corbin, who possessed four legs and two pelvises (cf. Bogdan 1988: 97). Another historical performer had a parasitic twin growing from his chest, who, although male, was presented as female – and called 'Pirmal and his Sister Sami, the Double-Bodied Hindo Enigma' (Bogdan 1988: 96).

Within its curious world of multifaceted circus-related characters and circus references, the movie *City of Lost Children* presents us with yet another example of a fictional flea that although feeding off his owner does not weaken him and even *gives* something back: revenge in Marcello's case, wealth and health in the literary examples. In doing so the parasite in these narratives acts as a *non-parasite*, and it is interesting to note that this flea-related role reversal – in the form of parasites becoming hosts – can also be found in the biological realm. Fleas do not only cause disease by sucking blood or passively transmitting disease-causing bacteria – *Yersinia pestis* causing the plague; *Rickettsia* spp. causing murine typhus; and *Bartonella* spp. causing cat-scratch disease; they also act as intermediate hosts for other parasites (cf. e.g. Bitam 2009). For instance, the most prevalent tapeworm of dogs – *Dipylidium caninum* – is transmitted by fleas. Tapeworm eggs shed with dog faeces are taken up by flea larvae. These infected larvae develop into adult fleas and ingestion by a dog leads to the transmission of the tapeworm. Michel Serres' statement that '[t]he chain of parasitism is a simple relation of order, irreversible like the flow of the river. One feeds on another and gives nothing in return' (2007: 182) is thus slightly at odds with these 'role changes' in both biology and cultural flea-interpretation.

In contrast to the performing flea circus protagonists discussed in this section, who live together in mutual harmony with their ringmaster-trainers and cause physical harm only on command (if at all), another cultural parasite – the clown-parasite – forces its host to act differently, and in so doing draws upon and refashions the classical Greco-Roman model of the social parasite.

RED NOSE AND PROBOSCIS, OR CLOWNS AND PARASITES

[The parasite] goes on stage, sets up the scenery, invents theater, and imposes theater. He is all the faces on the screen. If he is a man, he is at the origin of comedy, tragedy, the circus and the farce

(Serres 2007: 63–64)

A hallmark of parasites is their subversive and subtle nature. They hide in or amongst host cells and tissues, often using or mimicking host components for camouflage to be undetected by the host's immune defense. But some parasites also use advertisement rather than stealth as a strategy as in the case of the green-banded brood sac (*Leucochloridium paradoxum*): this fluke of birds is shed from its host via bird droppings. Snails then take up the eggs of the parasite by ingesting the bird droppings. The parasite develops inside the snail and leads to a thickening of the eyestalk that is decorated in bands of different greens. In addition, the infected eyestalk contracts rhythmically, mimicking a juicy caterpillar. Birds get infected by picking these eyestalks of snails and eating them. Infected eyestalks regenerate, representing another billboard for the parasite's transmission.

Benefitting at the expense of its host, a parasite lives on or in another species. But only since the nineteenth century has the term *parasite* been used systematically in the biological realm (although it already appeared in the writings of early botanists in the seventeenth century). In 1755, *Samuel Johnson's Dictionary* defined 'parasite' as 'one that frequents rich tables, and earns his welcome by flattery' (Den Otter 2004: 218; cf. Taylor-Brown 2015: 14–15; Drisdelle 2010: 14). This comes as no surprise as originally in ancient Greece and Rome, *parasite* meant a man who, being an aficionado of free food, joined dinners at rich homes without an invitation. This parasite seems to have been patronized and well-received, however, because he tended to 'earn' his meal through various funny entertainments (cf. Winkler 2005, 228; for a discussion of the hungry dependents in the *Odyssey* as future parasites of the comic stage, see Tylawsky 2002). 'Without him', Michel Serres writes, 'the feast is only a cold meal. His role is to animate the event. He is a social role and thus, theatrical' (2007: 190). Is the parasite thus a proto-clown? As cultural history uncovers, there is indeed a kinship relationship between clowns, circus, buffoons and parasites.

An anthropological constant and an archetype of the circus that represents productive anarchy and laughter, clowns (or clown-like characters) exist in all cultures. Due to their multiple identities and multifarious group of fellow tricksters from different times, cultures and media (jesters, pícaros, harlequins, pierrots, pagliacci, to name a few), it is very difficult to define their essential nature. In circus contexts, clowns are often defined by their idiosyncratic looks and their ongoing struggles with the perfidities of (misused) objects (for a discussion of the cultural background and characteristics of circus clowns see Jürgens 2016: 63–69, 265–317). But, according to Enid Welsford, the most essential ability of the clown lies in his 'art of improvisation' manifested in his artistic aptitude for spinning tales; he is an 'amphibian equally at home in the world of reality and the world of imagination', a dramatic character who 'usually stands apart from the main action of the play, having a tendency not to focus but to dissolve events, and also to act as intermediary between the stage and the auditorium' (Welsford 1966: xii, xiii, 14). Welsford traces the Stage-Clown – 'a type of Fool whose folly is admittedly a matter of make-believe'

(1966: xiii), the court-fool, and their transformations in popular imagination, back to the Hellenic laughter-making parasite that he calls Buffoon.

Discussing sources from as early as the second century AD, including Athenaeus' *The Sophists at Dinner*, Welsford discovers that the term 'parasite' originally was a dignified title reserved for those associates of priests and magistrates who were *invited* to official banquets. It was used by writers of the Middle and New Comedy in a more degraded sense, which led to the formation of a new comic character as they applied it to 'those whose position at table was due neither to right nor to courtesy but to their own impudence', and to their talent for mimicry and laughter-making (Welsford 1966: 4). 'As long as ancient civilization lasted', Welsford summarizes, 'the passing of the centuries made little difference to the parasite', who disappears with the fall of Rome though, only to reappear in the late Middle Ages and Renaissance in the shape of the Italian Buffoon (1966: 6, cf. 19, 14). The historical figure of the jesting buffoon, who is 'a spiritual as well as a material parasite', also existed in sixteenth-century England, Germany and France, where he was often indistinguishable from the court-jester (cf. Welsford 1966: 55, cf. 28, 20–24). However, as Welsford's cultural and social history of clown-characters unveils, the parasite-buffoon is not only part and parcel of the actual life of different societies, but has also been – and continues to be – a source of and vehicle for vivid transcultural imaginaries of ambivalent funsters. In the nineteenth century, for instance, the parasite-buffoon's comic heritage is acknowledged by a confidante of Honoré de Balzac. Originally, Balzac had planned to call one of his novels, *Le Cousin Pons* (published in 1847), 'Le Parasite'. But his lover, Mme Hanska, convinced the author that the latter was 'only suitable for an eighteenth century comedy' (Taylor-Brown 2015: 15). Whether onstage, in the circus arena, in novels or movies, the parasite-buffoon or clown-parasite seems to not have lost any of its attractiveness over the last two centuries, and one of its most prominent recent incarnations is Betelgeuse (pronounced 'Beetlejuice'), portrayed by Michael Keaton in Tim Burton's 1988 cult movie *Beetlejuice*. Beetlejuice is the perfect clown-parasite.

TROUBLED BY THE LIVING? CALL BEETLEJUICE, THE CLOWN-PARASITE

Beetlejuice is the story of Barbara and Adam Maitland, a young couple who do not survive a car crash but continue to live in the house they lived in before, although that house is bought and renovated by the Deetz family. Desperate to get rid of the Deetzes, the couple consults a *Handbook for the Recently Deceased* and as a result asks for help in an afterlife waiting room, where they are faced with macabre bureaucracy and an overworked caseworker who warns them against her former assistant, the obnoxious freelance Bio-Exorcist Betelgeuse, whom they contact anyway. In what follows, Beetlejuice wreaks total supernatural havoc on the new owners. After much chaos, including a wedding prevented at the last moment, unwittingly performed exorcism and a ride on a huge sandworm, Beetlejuice ends up in the post-mortem waiting room while the Maitlands and Deetzes live together in harmony within their shared house.

Beetlejuice does not only look like a morbid clown, wearing Joker-like green hair (cf. Jürgens 2014), heavy make-up and a flashy suit, but embodies a whole plethora of characteristic clown features. He moves eccentrically, laughs grotesquely, contradicts himself and has an inclination for criminal activity: by

fondling Barbara, by being an uncontrollable troublemaker, a ‘pervert’ who is ‘sleazing around the cemetery’, as the caseworker phrases it in the movie. He displays a disrespectful attitude towards social conventions and taboos, which is typical for clowns in their respective worlds (cf. Zucker 1967: 307; Christen 2010: 189). ‘The clown then is an imposter, arrogating human dignity and status’ and can slip into a variety of different roles, which is what Beetlejuice does, whose job it is to help ‘to adjust in eternity’, if one is ‘troubled by the living’ (see Beetlejuice’s flyer in the movie; cf. Zucker 1967: 311).

Beetlejuice’s principal activity is to *interfere* with the dead and the living; he is thus ‘in between’ – which is what according to Michel Serres defines the parasite as ‘productive and creative noise’. And the ‘noise is a joker’ (2007: 67). Serres gives an example: a telephone conversation can be ‘parasited’ by a variable that disrupts the wire connecting the telephones, as the parasite operates by interrupting and incapacitating the system as noise (cf. Serres 2007: 66; Winkler 2005: 229). However, the parasite does not merely interrupt communication; it also opens up new channels and thus makes possible new kinds of exchange, a new form of complexity, which is what happens in the case of Beetlejuice. Serres gives another example that helps us understand this facet of the parasite. At the door of a restaurant, a poor, hungry man is confronted with an angry kitchen hand who does not want to give him free food. A third person arrives – the parasite:

Give me a coin, he said. The wretch did so, frowning. He put the coin down on the sidewalk and with the heel of his shoe made it ring a bit. This noise, he said, giving his decision, is pay enough for the aroma of the tasty dishes.

(2007: 34–35)

The parasite transforms the relationship between two parties; ‘he invents a new logic’ (Serres 2007: 35). This is exactly what Beetlejuice achieves through his clown-actions: at the end of the movie, Mr Deetz reads a journal with the title ‘The Living and the Dead: Harmonious Lifestyles and peaceful co-existence from the author of Handbook for the Recently Deceased’. The havoc initiated by the parasite-clown thus acts as a catalyst for a new form of cohabitation, affecting the lives of the living *and* the dead, forcing his ‘hosts’ to act differently. This clown-parasite, through its interruption, is a catalyst for a new order.

MADE (TO) PERFORM

Interference with communication signals and opening up new channels are also relevant at another level: several parasites modulate the behaviour of their hosts for their own benefit up to the point where the host is completely enslaved by the parasite and subject to its ‘will’. The host becomes instrumentalized to entirely serve the purpose of the parasite. Once inside an ant, for instance, the lancet liver fluke *Dicrocoelium dendriticum* ‘becomes a deadly control freak’, forcing the ant to offer itself up to be eaten on the top of a blade of grass (Drisdelle 2010: 96–97, cf. 16, 36). The guinea worm (*Dracunculus medinensis*) is another example: to ensure an easier leap to the next water-bound host, it causes a burning pain on the legs and feet that makes his human host walk to the next cooling water hole. There is also *Briarosaccus*

callosus, a parasitic barnacle that, after having made its way through the body of a crab, directs its host's activities to better reproduce – a strategy used by *Toxoplasma gondii* as well, which in rats represses the innate fear of cats, leading to a higher probability to be eaten by a cat, because cats are the definitive hosts for this single-celled parasite (cf. Vyas 2013; Drisdelle 2010: 98, 101). Parasitic manipulation – or dressage? – of this kind is the substance of nightmares and horror movies. It is also a common scenario in circus and clown contexts, in which it manifests itself in multifaceted imaginaries of parasitic remote control.

In fiction, the passion for the Arts of the Ring often becomes a serious and life-threatening obsession when protagonists are so devoted to their circuses and their respective acts that they fight fanatically for their circus' survival (see, e.g., Michael Raleigh's *The Blue Moon Circus*), give up a sedentary life (see, e.g., Katharine Susannah Prichard's *Haxby's Circus*) and, in the majority of cases, risk their own life in the pursuit of their art (cf. McLean's *Circus* or Franz Kafka's *A Hunger Artist*). The same ambitions and attitudes can be found in the writings of non-fictional showmen defining circus as 'a sort of disease. Few men, once victims, are every permanently cured' (Bogdan 1988: 83). Showmen used expressions like 'sawdust in my blood' and 'circus fever' to indicate that they have been 'infected' by circus frenzy, that the circus turned into an obsession overshadowing all other aspects of their lives – that the circus became a parasitic *idée fixe* (cf. Bogdan 1988: 83; Jürgens 2016). An obsessive, torturous idea that is attached to everything, or to which everything attaches, is, according to Paul Valéry, 'un autre, un parasite' – the other: 'a parasite' (1965: 28–29 [French: 14]). Such a parasitic idea or 'fever' can be self-directed but also control others.

Arthur Conan Doyle's novel *The Parasite*, first published in 1894, is a prime example of parasitic control, in which Miss Penclosa – an Indian lady with a deformed leg and psychic powers – imposes her predominantly alien will upon the protagonist (the physiology Professor Gilroy, a lover of exact knowledge and foe of surmise and fancy) to prove that hypnotic suggestion is real. When Gilroy rejects her growing affection, she starts to play tricks on him using her powers to make him long for and caress her. 'She has a parasite soul', realizes Gilroy, 'yes, she is a parasite, a monstrous parasite. She creeps into my frame as the hermit crab does into the whelk's shell' (Conan Doyle 2011: 34). Finally, she transforms the professor into 'the laughing-stock of the university', a clown, who makes involuntarily silly jokes and produces the 'most outrageous things' such as 'the most preposterous statements', 'the most outrageous and unscientific heresies' (Conan Doyle 2011: 49, 50). She *makes him perform* (for more nineteenth-century examples, see Silver 2002: 128).

Contemporary circus-related versions of parasitic remote control include circus(-like) performers who telepathically control the brains of others. Carl-Johan Vallgren's 2002 novel *The Horrific Sufferings of the Mind-Reading Monster Hercules Barefoot: His Wonderful Love and his Terrible Hatred* provides a recent example. The eponymous hero (also called Hercule) is the 'quintessence of human deformity', in fact 'so deformed [...] should never have been allowed to be born' (Vallgren 2005: 24, 51; original emphasis). At the end of a cascade of tragic events, he joins an obscure variety show, a travelling troupe of freak performers including a 'hermaphrodite, inspiringly named Gandolfo Bonaparte and said to be Emperor Napoleon's bastard child'; a girl with four tongues; 'Louis and Louise who had been joined at the waist since birth, who always spoke simultaneously;' and a cyclops with three eyes (Vallgren 2005: 93). Hercule is not

merely able to read other people's thoughts; he can also plant messages *in their minds* that affect third parties (with hideous consequences). His telepathic powers are described as stepping 'right into' the other: he gets 'inside him as a parasite intrudes unnoticed into a human body' (Vallgren 2005: 28). But not only single performers, even a *whole circus* can act as a parasite, sucking out the souls of its audiences as depicted by Will Elliott in his circus horror novels *The Pilo Family Circus* (2006) and *The Pilo Traveling Show* (2015).

MADE TO HARVEST HUMAN SOULS FOR ENTERTAINMENT: MULTIFACETED CIRCUS-PARASITISM IN PILO'S CIRCUS SHOW

The clowns [...] I had to [...] the clowns made me

(Elliott 2006: 48)

The Pilo Circus saga by Will Elliott presents the story of Jamie, an everyday dude and deadbeat, who is chloroformed by three infernally deranged, sadistic clowns, kidnapped and dragged into the Pilo Family Circus – a nightmarishly violent and savage alternative universe. Once trapped on the circus grounds, Jamie is forced to become a clown. Wearing a silly costume and white face paint, he transforms into a different self, a murderous psycho, who becomes a physical danger to himself. Jamie is told that he became part of that monstrous circus because he has been given a second chance:

You see, you were meant to die young, and before you died you were to live miserably. [...] Everyone here was saved from death. That is why they stay. They owe something to the show – you, I, everyone else here.

(Elliott 2006: 80)

According to Michel Serres, being answered without having called, being given an 'uncalled-for opinion' and having to be grateful to some self-declared benefactor, saviour or father is *experiencing parasitism*:

You live with no other need, and suddenly, someone claims to have saved your country, protected your class, your interests, your family, and your table. And you have to pay him for that, vote for him, and other such grimaces.

(2007: 22)

Jamie gets displaced and finds himself in debt. Here again, the 'host' is hostile, subject, object, friend and enemy. In Pilo's insanatorium, clownbagged Jamie has to be grateful for being abused: "One thing you're going to have to become accustomed to", said Gonko, pulling a steel hatchet from one of his seemingly bottomless pockets, "is a little violence, here and there. It's good for you. Bracing, like cold showers" (Elliott 2006: 90). This specific parasitic situation is a motivational force for the following events in the novel as, in Serres' words, it is 'something to get angry about' (2007: 23) – who would thank the one who decides for you without being asked? The passive object, who in the Pilo saga is forced to be grateful for being violently abused, has to suddenly wake up and lash out in anger (cf. Serres 2007: 24). It thus comes as no surprise that Jamie finally brings the whole circus down, including all (other) violent clowns.

However, in Elliott's novels, circus-parasitism also plays a global role as Pilo's show is the ultimate parasite, and this is how it works:

Ticket collectors bring in the tricks [...] They find circuses happening here in the real world, like those once-a-year bashes they have in the capital cities. They set up their gate in there, in a spot where no one would notice anything amiss – sometimes in the places of the actual entrance. The gates are like spider's webs. The tricks just wander through into our show.

(Elliott 2006: 200)

The better entertained these 'tricks' (visitors) are, the more they laugh at the funnies, buy trinkets and souvenirs from the stall and behave 'themselves like sheep on Ritalin' (Elliott 2006: 136), the more soul dust they lose, 'soul dust' being a powder (little diamond crystals) that once collected by the circus folks and consumed, makes almost all wishes come true. 'Always taking, never giving' (Serres 2007: 24), ringmaster Pilo's whole crew is addicted to that drug, such as 'the bosses below' (Elliott 2015: 126) – antediluvian, pre-historic creatures, the absolute evil, managing the show. Nibbling on the human soul dust, these beings can see the whole life of the person; it is 'not just their food, it's their entertainment' (Elliott 2015: 127). Pilo's circus is a farm for human souls for entertainment; it is 'in between' two worlds, borrowing the laws of reality from both places: the circus is responsible for humankind's most horrific tragedies, as the circus' clowns have been recruited throughout history to regularly visit the normal world and steer the course of human events in gruesome ways. For instance, they influenced a certain failed Austrian artist with the initials A. H. to change the fate of the world, and kill a one-month-old baby to avoid it becoming a scientist who would discover 'some miracle cures' (Elliott 2006: 202). At the end, when the show is ravaged by Jamie and others, '[t]he realities split and parted, and the foreign thing dropped away like a parasite forced by death to finally release its fangs' (Elliott 2015: 222).

CIRCUS-PARASITES

Parasites are fascinating and appalling in equal measure. However, the more parasites are subjected to analysis, the more appreciation – if not respect – one has to show them. The scientific community has moved away from seeing parasites as 'selfish destroyers', accepting parasitism as a lifestyle and exploring the multitudes of facets afforded by parasites. Living in a paradise, where the host provides a constant and almost unlimited supply of nutrients, shelter and free transportation, parasites have shifted their focus to the challenge of dispersal, finding new hosts and avoiding the hosts' immune systems. This is where parasites have developed their true mastery by applying a vast array of skills, tricks and extraordinary feats (as outlined in Claude Combes' 2005 book *The Art of Being a Parasite*). In most cases, parasites 'walk the tightrope' by very carefully balancing their needs with the harm they inflict on the host. Any misstep will result in devastating consequences not only for the host, but ultimately for the parasites themselves. After all (especially given the often taxing routes of transmission and involvement of various hosts) it is in the interest of the parasite not to kill its host and thereby destroy the wonderland in which it lives. Frequently, complications for the host can be caused by the action of its own immune system in response to the parasite and not so much by

the parasite itself. Similarly, with respect to human parasites, the social stigma attached to these infections often provides a larger challenge to the infected person than the effects of the parasites themselves (although annoying, they are not necessarily life-threatening).

It might come as a surprise that the appreciation of parasites in the arts took place long before biologists acknowledged their contribution – as this article underscores. Parasites are now accepted as stabilizers of ecosystems and drivers of evolution and biodiversity. They have been shown to be instrumental in explaining why animals and plants have sex and why most organisms have defined lifespans. The study of host–parasite interactions can unravel important biological principles, and parasites themselves represent a treasure trove for biological compounds to fight diseases (e.g. blood clotting inhibitors from leeches). Parasites are not a ‘freakshow of nature’, but a stable and necessary fibre in the fabric of life.

With this growing awareness of parasites’ contribution to life, the influence that parasites have on humans also becomes clearer. The footprint of parasites can be seen everywhere – if only we deign to look for it: they have had an impact on our DNA, e.g. mutations in red blood cells are the most common mutations found in humans and are believed to be selected for by exposure to malaria parasites (cf. Maier et al. 2003); they have depopulated large areas by distributing pathogens (as illustrated by the impact the plague spread by fleas had on medieval Europe); they have often influenced the course of history (e.g. tipping the balance in battles due to parasitic infections); and, as this article shows, they play a vivid part in our *cultural* imaginary and memory.

Although ‘*Homo sapiens*’ realized ‘that *Pulex irritans* [flea] could be entertaining many centuries before discovering that it could be deadly’ (Furgurson 2011: 92.), and ‘clown fleas and high wire fleas and fleas on parade’ became literally huge in the world of John Hammond, the entrepreneur and investor who built a dinosaur park after creating flea circuses (in *Jurassic Park* [Spielberg, 1993]), fleas are not the only parasites that have become a mutable popular *cultural* force and multifaceted source of comic artistic inspiration. We can conclude that beyond fears of personal (and national) usurpation, many discourses relate to various forms of parasites and parasitology. From these discourses emerge not merely reflections on changeability (the parasite forces a system to change, cf. Serres 2007: 191, 194) but also on communicative and scientific pursuits, on interspecies relationships and fantasies of dressage. Body concepts (particularly: loss of bodily control, but also what is ‘one’s own’ and what is ‘foreign’) are explored in the context of parasitism in culture, such as multiplicity and indistinguishability – embodied, for example, in parasites that transform their ‘hosts’ into clowns – and (thus) comic cultural characters. Discussing these cultural phenomena may serve to broaden the frontiers of both parasitology and Serres’ definition.

According to Serres, all parasites are ‘abusive guest[s]’ and share the same systemic function: as the ‘ur-dynamic of social and cultural relations’, they interrupt a normal flow (of food, life or power) and feed upon the diverted energy in a ‘one-way relation’ (Wolfe 2007: xv; cf. Serres 2007: 8, 5). Representations and interpretations of parasites in fiction and (popular) culture have produced their own genres, in which they aggrandize (‘hyperbolize’) the parasite. The latter thus takes on new skills, for instance by acting as a helpful partner and saviour, which adds some new facets to Serres’ trope of the parasite. Imaginary parasites reconfigure, romanticize and parody parasitology by grounding it in literary and cultural discourse and thus perform

several functions that Serres does not discuss: they explore ways of *performing* parasitism; *perspectives of* the parasite; the *experience* of parasitism – of being parasitized – or new ways of *experiencing one's self* through parasites; and comic scenarios and narratives hidden in anxieties of involuntarily shared identities. In other words, in our cultural imaginarium of the parasite, there are flea performers who, although making dependency their business, do not act like parasites at all but live together in mutual harmony with their ring-master-hosts and engage in an inverted vampirism. There are clowns who cause parasitic disruption and create a new order by forcing their 'hosts' to act differently and there are fictional parasite-protagonists who make their 'host' act like clowns. In circus contexts, these imaginary parasites parody the hyperbolic aesthetics, rhetorical pyrotechnics and never-seen creatures traditionally promised by the Arts of the Ring, such as 'whirling wonders' flying 'through the stratosphere with impeccable timing and gravitational grace', who – 'inspired by the fantastic' – '[w]ith every revolution [...] overwhelm you with death-defying dexterity' (Ringling Bros., Barnum & Bailey Circus and The Greatest Show on Earth [RBBB] 2014). Further research will show the part that parasitologists themselves (have) play(ed) in these constructions, and has to carve out (comic) literary parasites in conjunction with the cultural history in which they were situated. But we can conclude, with German literary scholar Renate Lachman: 'the fantastic as the impossible, the counter-rational and the unreal cannot exist without the world of the real, the possible, the rational' to which it has a 'parasitic dependence' (Lachmann 2002: 10, trans. ASJ).

REFERENCES

- Andersen, Hans Christian (1960), 'The Flea and the Professor', in *Fairy Tales and Stories* (trans. R. Spink), London: Dent, pp. 404–09.
- Bitam, I., Rolain, J. M., Kernif, T., Baziz, B., Parola, P. and Raoult, D. (2009), 'Bartonella species detected in rodents and hedgehogs from Algeria', *Clinical Microbiology and Infection: the Official Publication of the European Society of Clinical Microbiology and Infectious Diseases*, Special Issue: 'Advances in Rickettsiology', 15:2, pp. 102–03.
- Bogdan, Robert (1988), *Freak Show: Presenting Human Oddities for Amusement and Profit*, Chicago: University of Chicago Press.
- Carlson, Colin J., Burgio, Kevin R., Dougherty, Eric R., Phillips, Anna J., Bueno, Veronica M., Clements, Christopher F., Castaldo, Giovanni, Dallas, Tad A., Cizauskas, Carrie A., Dona, Jorge, Harris, Nyeema C., Jovani, Roger, Mironov, Sergey, Muellerklein, Oliver C., Proctor Heather C. and Getz, Wayne M. (2017), 'Parasite biodiversity faces extinction and redistribution in a changing climate', *Science Advances*, 3:9, <https://advances.sciencemag.org/content/3/9/e1602422/tab-pdf>. Accessed 12 January 2019.
- Chang, Chris (1995), 'City of lost children', *Film Comment*, 31:6, pp. 6–9.
- Chemers, Michael M. (2004), 'Jumpin' Tom Thumb: Charles Stratton onstage at the American Museum', *Nineteenth Century Theatre and Film*, 31:2, pp. 16–27.
- Christen, Matthias (2010), *Der Zirkusfilm: Exotismus, Konformität, Transgression*, Marburg: Schüren.
- Cirque du Soleil (2018), *Ovo*, programme booklet.
- Combes, Claude (1996), 'Parasites, biodiversity and ecosystem stability', *Biodiversity and Conservation*, 5, pp. 953–62.

- (2005), *The Art of Being a Parasite*, Chicago: University of Chicago Press.
- Conan Doyle, Arthur (2011), *The Parasite*, London: Electric Book Company.
- Darwin, Charles Robert (1860), 'To Asa Gray', Darwin Correspondence Project, Cambridge: Cambridge University, <https://www.darwinproject.ac.uk/letter/DCP-LETT-2814.xml>. Accessed 12 January 2019.
- Den Otter, Alice G. (2004), 'Pests, parasites, and positionality: Anna Letitia Barbauld and "The Caterpillar"', *Studies in Romanticism*, 43:2, pp. 209–30.
- Dobson, Andy, Lafferty, Kevin D., Kuris, Armand M., Hechinger, Ryan F. and Jetz, Walter (2008), 'Homage to Linnaeus: How many parasites? How many hosts?', in J. C. Avise, S. P. Hubbell and F. J. Ayala (eds), *In the Light of Evolution, Volume II: Biodiversity and Extinction*, Washington, DC: The National Academies Press, pp. 63–82.
- Drisdelle, Rosemary (2010), *Parasites: Tales of Humanity's Most Unwelcome Guests*, Berkeley, LA: University of California Press.
- Elliott, Will (2006), *The Pilo Family Circus*, Sydney: ABC.
- (2015), *The Pilo Travelling Show*, Portland: Underland Press.
- Flohziirkus Birk Official Website (n.d.), 'Echter Oktoberfest-Flohziirkus Familie Birk', <http://www.flohziirkus.de/>. Accessed 12 January 2019.
- Furgurson, Ernest B. (2011), 'A speck of showmanship: Is that a "Pulex irritans" pulling that carriage, or is someone just pulling our leg?', *The American Scholar*, 80:3, pp. 92–97, <https://theamericanscholar.org/a-speck-of-showmanship/#.W0bbRMlyXDc>. Accessed 13 July 2018.
- Grant, Mira (2013), *Parasite*, New York: Orbit.
- Hoffmann, E. T. A. (1946), 'Meister Floh', in M. Hurlimann (ed.), *Ausgewählte Werke in fünf Bänden: Märchen und Spukgeschichten*, vol. 5, Zürich: Atlantis.
- Holmes, John C. (1996), 'Parasites as threats to biodiversity in shrinking ecosystems', *Biodiversity & Conservation*, 5:8, pp. 975–83.
- Jackson, Andrew (2015), 'Preface: The evolution of parasite genomes and the origins of parasitism', *Parasitology*, 142:1, pp. 1–5.
- Jürgens, Anna-Sophie (2014), 'Batman's Joker, a neo-modern clown of violence', *Journal of Graphic Novels and Comics*, 5:4, pp. 441–54.
- (2016), 'Circus as Idée fixe and hunger: Circomania in fiction', *CLCWeb: Comparative Literature and Culture*, 18:3, n. pag.
- Keifetz, Mandy (2012), *Flea Circus: A Brief Bestiary of Grief*, Kalamazoo: Western Michigan University.
- Lachmann, Renate (2002), *Erzählte Phantastik: Zu Phantasiegeschichte und Semantik phantastischer Texte*, Frankfurt am Main: Suhrkamp.
- Lawton, Graham (2012), 'Fleedom or death: Reviving the art of the flea circus', *New Scientist Issues*, 2896–97, 18 December, pp. 53–55, <https://www-sciencedirect-com.virtual.anu.edu.au/science/article/pii/S0262407912632667>. Accessed 12 January 2019.
- Lehane, Brendan (1969), *The Compleat Flea*, New York: The Viking Press.
- Maier, Alexander G., Duraisingh, Manoj, Reeder, John, Patel, Seral, Kazura, James, Zimmerman, Peter and Cowman, Alan (2003), 'Plasmodium falciparum erythrocyte invasion through glycophorin C and selection for Gerbich negativity in human populations', *Nature Medicine*, 9:1, pp. 87–92.
- Maria Fernanda Cardoso Official Website (n.d.), 'Cardoso Flea Circus', <https://mariafernandacardoso.com/documentaries/animal-art/cardoso-flea-circus-video-n/>. Accessed 12 January 2019.
- Murray, Robin L. and Heumann, Joseph K. (2016), 'Parasite evolution in the eco-horror film: When the host becomes the monster', in R. L. Murray and J. K. Heumann (eds), *Monstrous Nature: Environment and Horror on*

- the Big Screen*, Lincoln, NE and London: University of Nebraska Press, pp. 125–42.
- Nickell, Joe (2005), *Secrets of the Sideshows*, Lexington: University Press of Kentucky.
- Poulin, Robert (2007), *Evolutionary Ecology of Parasites*, Princeton: Princeton University Press.
- Prystash, Justin (2016), 'Vectors of a flea: The convergence of species in Victorian animal autobiographies', *Mosaic*, 49:1, pp. 37–53.
- Ringling Bros., Barnum & Bailey Circus and The Greatest Show on Earth (RBBB) (2014), *Legends*, programme booklet.
- Sallares, Robert (2002), *Malaria and Rome: A History of Malaria in Ancient Italy*, New York: Oxford University Press.
- Serres, Michael (2007), *Parasite*, Minneapolis: University of Minnesota Press.
- Shigemi, Inaga (2002), 'In der Haut des Anderen: Iwaaki Hitoshis Comic-Roman Parasitentiere (Kiseijû) als Herausforderung an das unteilbare "Individuum"' (trans. J. Berndt), in C. Geissmar-Brandi (ed.), *Geschichte der Haut*, Frankfurt: Stroemfeld Verlag, pp. 129–46.
- Silver, Anna Krugovoy (2002), *Victorian Literature and the Anorexic Body*, Cambridge: Cambridge University Press.
- Spielberg, Steven (1993), *Jurassic Park*, USA: Amblin Entertainment.
- Taylor-Brown, Emilie (2014), '(Re)Constructing the knights of science: Parasitologists and their literary imaginations', *Journal of Literature and Science*, 7:2, pp. 62–79.
- (2015): "'She has a parasite soul!": The pathologization of the Gothic monster as parasitic hybrid in Bram Stoker's *Dracula*, Richard Marsh's *The Beetle* and Arthur Conan Doyle's *The Parasite*', in S. Hutchison and R. A. Brown (eds), *Monsters and Monstrosity from the Fin de Siecle to the Millennium: New Essays*, Jefferson, NC: McFarland, pp. 12–28.
- Toll, Robert C. (1976), *On with the Show: The First Century of Show Business in America*, New York: Oxford University Press.
- Tyagi, Nidhi, Farnell, Edward J., Fitzsimmons, Colin M., Ryan, Stephanie, Tukahebwa, Edridah, Maizels, Rick M., Dunne, David W., Thornton, Janet M. and Furnham, Nicholas (2015), 'Comparisons of allergenic and meta-zoan parasite proteins: Allergy the price of immunity', *PLoS Computational Biology*, 11:10, <https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1004546>. Accessed 12 January 2019.
- Tylawsky, Elizabeth Ivory (2002), *Saturio's Inheritance: The Greek Ancestry of the Roman Comic Parasite*, New York: Lang.
- Valéry, Paul (1934), *L'Idée fixe*, Paris: Gallimard.
- (1965), *Idée fixe* (trans. D. Paul), New York: Bollingen Foundation.
- Vallgren, Carl-Johan (2005), *The Horrific Sufferings of the Mind-Reading Monster Hercules Barefoot*, London: Vintage.
- Vyas, Ajai (2013), 'Parasite-augmented mate choice and reduction in innate fear in rats infected by *Toxoplasma gondii*' (review), *The Journal of Experimental Biology*, 216:120&126 (Part 1), pp. 120–26.
- Wangchuk, Phurpa, Shepherd, Catherine, Constantinoiu, Constantin, Ryan, Rachel Y. M., Kouremenos, Konstantinos A., Becker, Luke, Jones, Linda, Buitrago, Geraldine, Giacomini, Paul, Wilson, David, Daly, Norelle, McConville, Malcolm J., Miles, John J. and Loukas, Alex (2019), 'Hookworm-derived metabolites suppress pathology in a mouse model of colitis and inhibit secretion of key inflammatory cytokines in primary

- human leukocytes', *Infection and Immunity*, 87:4, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6434117/>. Accessed 12 January 2019.
- Welsford, Enid (1966), *The Fool: His Social and Literary History*, Gloucester: Peter Smith.
- Windsor, Donald A. (1995), 'Equal rights for parasites', *Conservation Biology*, 9:1, pp. 1–2.
- Winkler, Isabella (2005), 'Love, death, and parasites', in N. Abbas (ed.), *Mapping Michel Serres*, Ann Arbor: University of Michigan Press, pp. 226–42.
- Wolfe, Cary (2007), 'Bring the noise: *The Parasite* and the multiple genealogies of posthumanism', in M. Serres (ed.), *Parasite*, Minneapolis: University of Minnesota Press, pp. xi–xxviii.
- Zucker, Wolfgang M. (1967), 'The clown as the lord of disorder', *Theology Today*, 24:3, pp. 306–17.

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