



PIOTR F. PIEKUTOWSKI

 <https://orcid.org/0000-0002-1811-2073>

University of Silesia in Katowice

Institute of Literary Studies, Faculty of Humanities

## Swarm–Hybrid–Technology The Transmedial Possibilities of Becoming-Insect

Рой – гибрид – технология. Трансмедийные  
возможности становления-насекомым

### Абстракт

Согласно Розы Брайдотти, существование насекомых определяется понятиями «промежуточность» и постоянное «становление». В статье постоянное изменение внешнего вида насекомых в зависимости от условий существования анализируется на двух уровнях, то есть технологии, не связанной с человеком, и повествования в рассказах о метаморфозах, использующего элементы, нарушающие законы природы. Вслед за исследованиями Юсси Парикки в области медиаархеологии становление-насекомым анализируется на трансмедийных примерах из области литературы (Франц Кафка – *Превращение*), кино (Дэвид Кроненберг – *Муха*), видеоигр и виртуальной реальности (All in! Games – *Metamorphosis*) и сетевых СМИ. Исследование точек зрения, не принадлежащих человеку, и остранение в повествовании, согласно Яну Альберу, приводит к трансформации когнитивных рамок. Радикально Иные насекомые выходят за пределы антропоцентрической парадигмы и в гибридном сочетании с людьми и машинами реализуют постгуманистические прогнозы.

Swarm–Hybrid–Technology: The Transmedial  
Possibilities of Becoming-Insect

### Abstract

According to Rosi Braidotti, insects are determined by their in-between-ness and continuous becoming. The paper analyses the assemblage of insect figurations on two levels: non-human technology and unnatural narrative in stories about a transformation. Following Jussi Parikka's media archaeology research, becoming-insect is examined on transmedial examples from literature (Franz Kafka—*The Metamorphosis*), film (David Cronenberg—*The Fly*), video games and VR (All in! Games—*Metamorphosis*) and networked media. According to Jan Alber, exploration beyond human stances and defamiliarization in narrative fiction leads to the shift of cognitive frameworks. Radically Other insects transgress the anthropocentric paradigm and execute posthuman assumptions by a hybrid entanglement with humans and machines.

**Keywords:** insect, becoming-insect, metamorphosis, non-human technology, posthumanism

**Ключевые слова:** насекомое, становление-насекомым, превращение, технология, не связанная с человеком, постгуманизм

*New media generate new metamorphs.*<sup>1</sup>

No other group of animals have dug into modern techno-nature as significantly as insects. Their bodily fluidity translates into changing systems of organization and becomes an area for the search for thinking alternatives that differ from anthropocentrism. Insects currently interact on a fictional and real level with other actants in the environment; their hybrid relationships with humans and technology seem particularly interesting. To this end, I would like to show how the media negotiate these embodied fusions of humans and insects and how the radical Otherness of these animals is taken over by technology that today is not only based on non-human solutions but becomes an extension of metamorphs.

In this article, I focus on three essential representations: literary, film, and game/VR, which on the levels of communication, diegetic form and technology, show the potential of more-than-human assemblage. By assemblage, I mean a matter that is constantly becoming and has variable properties conditioned by current compositions and interactions with the environment. “In other words, assemblages are always constituted by a relationality.”<sup>2</sup> I start my considerations with a classic short story, *The Metamorphosis* by Franz Kafka; then, moving from prose to film, I examine posthuman displacements in *The Fly* directed by David Cronenberg. Finally, I return to Kafka’s fiction, but in its modern reinterpretation in the form of a video and VR game made by the Polish studio Ovid Works and published by All in! Games. Only the transmedial look at insect narratives reveals the endless possibilities of animal metamorphoses—their non-anthropocentricity and relationality. My research fits in the media archaeology trend of Siegfried Zielinski but in a posthuman reading. I am following the movement initiated by the Finnish media theorist Jussi Parikka in his monograph *Insect Media: An Archeology of Animals and Technology*. As I am trying to show, technological progress and unnatural forms of narratives constantly expand the repertoire of post-anthropocentric perspectives and, in line with Deleuzian thought, also create conditions for the further process of becoming-other.

---

<sup>1</sup> Bruce Clarke, *Posthuman Metamorphosis: Narrative and Systems* (New York: Fordham University Press, 2008), 2.

<sup>2</sup> Jussi Parikka, *Insect Media: An Archaeology of Animals and Technology* (Minneapolis: University of Minnesota Press, 2010), XXV.

## Unnatural Metamorphosis and Cognitive Frames

How is the case of Gregor Samsa transferred from literature to the visual medium? The German illustrator and set designer Ottomar Starke faced the answer to this problem when Kurt Wolff—the publisher of the first edition of Franz Kafka's *The Metamorphosis*—commissioned him to prepare a frontispiece. However, on October 25, 1915, Kafka, learning that Starke would be in charge of the illustration project, wrote a letter to the publisher on the matter: “It struck me that Starke, as an illustrator, might want to draw the insect itself. Not that, please not that! I do not want to restrict him, but only to make this plea out of my deeper knowledge of the story. The insect itself cannot be depicted. It cannot even be shown from a distance.”<sup>3</sup> A literal illustration of an insect would focus the reader's attention on concrete animality, thereby distancing, according to the author, from the more profound knowledge hidden in the text.

The writer's firm reaction to the potential attempt to visualize the protagonist of *The Metamorphosis* is especially puzzling when we take into account the presence of other non-human characters in Kafka's work.<sup>4</sup> However, unlike the other animal stories of the author, the narrator, describing the new nature of Gregor, focuses on his amazing monstrous physicality and, at the same time, avoids unambiguous systematization within a specific biological species. Interpretative assignment of the transformed actor to a peculiar cockroach (*Blatta orientalis*) or dung beetle (*Geotrupes stercorarius*) is possible thanks to fragmentary descriptions illustrating the protagonist's non-human body: “gigantic brown blotch,”<sup>5</sup> “back as hard as armor plate,”<sup>6</sup> “arch-shaped ribs,”<sup>7</sup> “numerous little legs.”<sup>8</sup> Using fragments of the text/body, we can attempt to indicate the constant attributes of Gregor's physicality or his mimicry, classifying him as a hybrid of specific insect species. Here, however, Dean Swinford, referring to the work of Jürg Schubiger, notices the ambiguity of assembling the protagonist of *The Metamorphosis*.

<sup>3</sup> Franz Kafka, *Letters to Friends, Family, and Editors*, trans. Richard Winston and Clara Winston (New York: Schocken, 1977), 114–115.

<sup>4</sup> It primarily refers to *Report for an Academy* (“Ein Bericht für eine Akademie”) (1917) and *Investigations of a Dog* (“Forschungen eines Hundes”) (1922).

<sup>5</sup> Franz Kafka, *The Metamorphosis: Translation, Backgrounds and Contexts Criticism*, trans. and ed. Stanley Corngold (New York, London: W.W. Norton & Company, 1996), 26.

<sup>6</sup> Kafka, *The Metamorphosis*, 3.

<sup>7</sup> Kafka, *The Metamorphosis*, 3.

<sup>8</sup> Kafka, *The Metamorphosis*, 6.

Schubiger points out that Gregor's form, weight, and actions result in an impossible combination. In this way, Samsa's insect body does not quite fit the unproblematic realism so characteristic of the rest of the narrative. Quite simply, Samsa's head, as determined by his ability to observe actions in the apartment, is too agile for the plate-armored head segment of a standard beetle. At the same time, his body cannot be so heavy as to require two men to move it and so lithe as to cling freely to the walls and the ceiling.<sup>9</sup>

The dissonance in the description of Gregor's body structure and the possibilities of interacting with the environment through it, whether by the protagonist or the narrator of the story, may undermine the animalistic interpretation of *The Metamorphosis*. Readings that emphasize other aspects of the story: economic, psychoanalytical, class, fit in with Kafka's distrust of the literal transfer of the insect protagonist to a frontispiece. These interpretations often treat the introduced category of the protagonist's animality in a secondary context, or the unnaturalness of this narrative for researchers first serves as a metaphorical reference to anthropocentric threads. The pretext treatment of divergent elements as an argument against posthuman interpretation is difficult to reconcile with the specificity of unnatural stories<sup>10</sup> in which Kafka's text undoubtedly fits.

Probably in the whole story by Franz Kafka, the most frequently repeated sentence in research, adaptations or intertextual references is the opening sentence: "When Gregor Samsa woke up one morning from unsettling dreams, he found himself changed in his bed into a monstrous vermin."<sup>11</sup> Stanley Corngold, a literary scholar and translator of Kafka's works, draws attention to the term used by the writer to describe a metamorph. *Ungeheuren Ungeziefer* translated by Cornogld as "monstrous vermin" does not refer to a specific insect species. "The concept of a vermin is not a natural thing, it has no predictable visual identity, it is not literally a thing: 'vermin' is a shifting social construction."<sup>12</sup> The term used by Kafka

<sup>9</sup> Dean Swinford, "The Portrait of an Armor-Plated Sign: Reimagining Samsa's Exoskeleton," in *Kafka's Creatures: Animals, Hybrids, and Other Fantastic Beings*, ed. Marc Lucht and Donna Yarr (Lanham, MD: Lexington Books, 2012).

<sup>10</sup> Trying to outline the poetics of unnatural narratives, I will refer to one of the most important researchers dealing with this subject, Jan Alber. "I posit a historically constant notion of the unnatural: to my mind, the world we inhabit is dominated by physical laws, logical principles, and anthropomorphic limitations that are permanent and stable. I thus assume that phenomena such as speaking animals, animated corpses, coexisting time flows, and flying islands were as impossible in the past as they are today." Jan Alber, *Unnatural Narrative: Impossible Worlds in Fiction and Drama* (Lincoln: University of Nebraska Press, 2016), 6.

<sup>11</sup> Kafka, *The Metamorphosis*, 3.

<sup>12</sup> Stanley Corngold, "Thirteen Ways of Looking at a Vermin: Metaphor and Chiasm in Kafka's *The Metamorphosis*," *Literary Research / Recherche Littéraire* 21, no. 41–42 (2004): 60.

is against the concretization of Gregor's form and instead refers to the causes and effects of including creation in the culturally variable category of vermin.<sup>13</sup> The narrative in the story contrasts the nebulous ontology and biology of the hybrid with the organized and detailed apartment of the Samsa. *The Metamorphosis*, as David Herman notes,

suggest how aversive reactions called up by (and constitutive of) vermin are anchored in violations of spatial boundaries, incursions of the nonhuman into ostensibly human territories. In this sense vermin can be defined as species entering spaces where they are not supposed to be, with norms based on hierarchical understandings of species difference translating into a normative model of animal geography.<sup>14</sup>

Gregor Samsa is unexpectedly expelled from both human territories, and his becoming-insect does not lead to assigning him one, permanent species. The protagonist of *The Metamorphosis* as a hybrid is no longer described by anthropocentric or anti-anthropocentric frames, he is only characterized by 'in-between-ness.' "So he is not, but 'has turned' into something that he was not and probably is not now either, if being means the possibility of some coherent story."<sup>15</sup> Gregor, however, remains in relation to both the human family and the place itself—the presence of worms "where they should not be" spreads the eponymous metamorphosis beyond the protagonist. It is not only the effect of transformation but a tool for deterritorialization and defamiliarization.

The new cognitive situation, which the recipient has never dealt with, orientates the experience in known (repeated in the past) frames that provide knowledge that can help him cope with unknown conditions.<sup>16</sup> The researchers of possible worlds, such as Marie-Laure Ryan, take a similar position. "We will project upon these [fictional—P. F. P.] worlds everything we know about reality, and we will make only the adjustments dictated by the text."<sup>17</sup> Ryan describes these conditions as "the principle of minimal departure."<sup>18</sup> The reader reconstructs a fantastic, counterfactual or unnatural narrative based on close and domesticated experiences. The real world is the

<sup>13</sup> David Herman, *Narratology Beyond the Human: Storytelling and Animal Life* (New York: Oxford University Press, 2018), 130.

<sup>14</sup> Herman, *Narratology Beyond the Human*, 129.

<sup>15</sup> Tadeusz Ślawek, *Śladem zwierząt. O dochodzeniu do siebie* (Gdańsk: Fundacja Terytoria Książki, 2020), 103, emphasis original.

<sup>16</sup> Roger C. Schank and Robert P. Abelson, *Scripts, Plans, Goals, and Understanding: An Inquiry into Human Knowledge Structures* (Hillsdale, N.J., New York: L. Erlbaum Associates, 1977), 37.

<sup>17</sup> Marie-Laure Ryan, *Possible Worlds, Artificial Intelligence, and Narrative Theory* (Bloomington: Indiana University Press, 1991), 51.

<sup>18</sup> Ryan, *Possible Worlds*, 51.

foundation on which history is mapped. Minimal departure becomes a cognitive simplification that fills places treated by the story as obvious or undefined elements. The initial realistic implications are changed only, as the researcher argues when the text of the expression dictates other rules. The problem arises when, as in the case of *The Metamorphosis*, becoming-insect and similar narratives opening the reader to foreign and non-human, minimal departure turns out to be the maximum distance. The non-human world is read as an (im)possible world, especially if we come from the anthropocentric level. This is also due to the radical otherness of insects, which is inconsistent with the world considered by humans to be real. Because, as Hugh Raffles writes about insects: “The more we look, the less we know.”<sup>19</sup>

Attempts to literally translate the more-than-human condition of Gregor Samsa into the parameters of the real world, as in the case of Schubiger’s analyzes, are lost in the mechanically accepted anthropomorphization. Insects, due to their multidimensional distance from humans, even, and perhaps primarily in their hybrid or cyborg assemblages, should be read not as ready-to-implement cognitive frameworks or scenarios, but rather as fluid frameworks from which xenonarratives and non-human figurations emerge. Jan Alber in his monograph *Unnatural Narrative* states: “Since unnatural scenarios and events are by definition physically, logically, or humanly impossible, they always urge us to create new frames by recombining, extending, or otherwise altering preexisting cognitive parameters.”<sup>20</sup> Alber’s words also reveal the possibilities brought about by *The Metamorphosis* and other insect narratives. Unnaturalness or defamiliarization in stories, as noted by the narrator, evokes a change of the existing framework of thinking. However, metamorphosis does not occur in a vacuum, in isolation from human conditions, but arises through the recombination of previous parameters and scenarios, similar to Gregor’s new hybridity. This correlates perfectly with the specificity of insects as a cluster that “dwells between different states of in-between-ness.”<sup>21</sup> Rosi Braidotti adds: “They [insects—P. F. P.] pose the question of radical otherness not in metaphorical but in bio-morphic terms, that is to say as a metamorphosis of the sensory and cognitive apparatus.”<sup>22</sup>

I want to make a move that Franz Kafka does not agree with in his letter to the publisher, although paradoxically the author himself provokes this procedure earlier—in the story. By giving the narrative perspective to an insect or figuration being a fusion, an intermediate being between a man and an insect, Kafka created a new, intimate, and unnatural experience. “It cannot even be shown from

<sup>19</sup> Hugh Raffles, *Insectopedia* (New York: Pantheon Books, 2010), EPUB.

<sup>20</sup> Alber, *Unnatural Narrative*, 49.

<sup>21</sup> Rosi Braidotti, *Metamorphoses: Towards a Materialist Theory of Becoming* (Cambridge, Malden, MA: Polity, 2002), 149

<sup>22</sup> Braidotti, *Metamorphoses*, 149.

a distance.”<sup>23</sup> A small insect captured by Ottomar Starke, as it was, by accident, in motion, as a background element of uncertain origin, could possibly appear in the frontispiece. The insect should be viewed from a distance. Standing in its form. Dead, frozen still behind the glass, as a beautiful specimen, part of the collection—as in the experience of the “insect mausoleum” described in *Insectopedia* by Raffles.<sup>24</sup> Then and only then, can a passive viewer ensure a sense of security of the physical, ontological, and symbolic boundaries so easily violated by insects.<sup>25</sup> In other conditions, strangeness and nomadic instability reveal their potential to destabilize the anthropocentric paradigm, but also the creative potential contained, for example, in the act of metamorphosis or becoming-insect.

Following Kafka, making a movement beyond the human requires abandoning permanent, human categories. It is possible at the same time by the non-natural narrative and its focalization on the insect. Showing an insect at close quarters, in the liquidity of an inhuman subject, reveals its radical alienation both to man and the animal world, which Aristotle already emphasized.<sup>26</sup> In such conditions, it also turns out that these tiny organisms, despite their strangeness, inhabit modern technoculture in large numbers, transform it and its cognitive frames with languages other than Gregor Samsa. However, these languages are still synonymous with their cross-border nature. Audiovisual and networked media create new space and immersive tools for non-anthropocentric narratives, while media archaeology reveals the non-human roots of technology which, as in David Cronenberg’s films, is clad in a chitinous exoskeleton.<sup>27</sup>

<sup>23</sup> Kafka, *Letters to Friends, Family, and Editors*, 114–15.

<sup>24</sup> The tanatical connotations of insects as animals involved in death are repeatedly referenced in cultural studies of these animals. Hugh Raffles, a British anthropologist, devotes one of the entries in his fragmentary encyclopedia to a visit to the Montreal Insectarium, which is the starting point for reflecting on the difference. Killed insects, which filled display cases, caused delight, peace and fascination. However, these feelings, Raffles admits, would immediately give way to chaos and horror when the specimens were miraculously resurrected. Only in the stillness of death was it possible to meet the insect, look at it and its symbolic existence. However, the attempt at an anthropomorphic gaze turns out to be a failure for the researcher—it highlights the interspecies difference. Raffles, *Insectopedia, Difference*, EPUB.

<sup>25</sup> Monika Żółkoś, “Mikro-formy i makro-lęki. Owady jako wyzwanie dla animal studies,” in *Zwierzęta i ich ludzie: Zmierzch antropocentrycznego paradygmatu*, ed. Anna Barcz and Dorota Łągodzka (Warszawa: Wydawnictwo Instytutu Badań Literackich PAN, 2015), 34–45.

<sup>26</sup> Eric C. Brown, “Reading the Insect,” in *Insect Poetics*, ed. Eric C. Brown (Minneapolis: University of Minnesota Press, 2006), IX.

<sup>27</sup> The non-humanity of technology in relation to the work of David Cronenberg is taken not only by *The Fly*, discussed later in this article. The director explores the hybrid relationships of insects (and, more broadly, animals) with technology and media in his later films: *Naked Lunch* (1991) and *eXistenZ* (1999). The insect archaeology of media is not only futuristic projections of biologically conditioned technologies and virtual worlds, as in *eXistenZ*. In *Naked Lunch*, literature and such a prosaic tool as a typewriter are conditioned by a non-human factor. In both, or rather three, cases, including

This is happening in the words of Bruce Clark—“New media generate new metamorphs.”<sup>28</sup>

## The Becoming-Insect From the Insect to Technology and Back

Media archaeology is based on a shift in thinking and (re)constructing the history of media and technology. Siegfried Zielinski, in his archaeological research, focused on forgotten or deliberately downplayed threads in media studies. He proposed a media story that was fragmentary, non-linear, movement, and in Gilles Deleuze’s terminology, an archaeological project of thinking about media as the rhizome.<sup>29</sup> The traditional development of technology is presented as a constant growth in which man occupies a central position, and the broadly understood technology and media constitute its superstructure, an anthropomorphic extension. Zielinski argues with this approach. “Technology is not human; in a specific sense, it is deeply inhuman. The best, fully functioning technology can be created only in opposition to the traditional image of what is human and living, seldom as its extension or expansion.”<sup>30</sup> Zielinski’s archaeological thinking is not so much formed on the negation of the traditional discourse, but similarly to the rhizome, he understands technology as a non-linear, branching project covering a much wider field of reference than the human being himself. In common understanding, technology is reduced to a set of machines and tools separated from humans and even more so from non-human beings. Gilbert Simondon understands technology more broadly as “transformations and correlations that characterize technical objects.”<sup>31</sup> Relational media also identify at the animal (including insect), plant, and inorganic level. By noticing their “deeply inhuman,” it is possible to draw a map of connections between people and non-people, as well as their mutual influence, which affects the ongoing metamorphoses. When reading the media as a collection of worldbuilding

---

*The Fly* in this cinematic juxtaposition, biocentric technology is the medium of metamorphosis that mediates between man and new more-than-human figurations.

<sup>28</sup> Clarke, *Posthuman Metamorphosis*, 2.

<sup>29</sup> Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (London: Bloomsbury, 2013).

<sup>30</sup> Siegfried Zielinski, *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*, Electronic culture (Cambridge, MA: MIT Press, 2006), 6.

<sup>31</sup> Adrian Mackenzie, *Transductions Bodies and Machines at Speed* (London, New York: Continuum, 2002), 25.



abilities<sup>32</sup> and, at the same time, keeping in mind their non-human genealogy, possible worlds and new narratives hold the promise of posthumanism.

In the book *Insect Media: An Archeology of Animals and Technology*, Parikka traces the diversity of connections between insects and technology. It thus goes from ancient times to the sudden increase in scientific and amateur interest in insects in the nineteenth century, coupled with equally dynamic technological development and industrialization.<sup>33</sup> However, as Parikka emphasizes, the new potential of insects, not only biological, but also communication or social, is beginning to resonate in the newest new audiovisual and networked media.

Technology has increasingly shifted from an issue of matter (as stability) to one of variation and metamorphosis. In this sense, the insect potential of transformation, variation, relation, and intensive environmental relations has also characterized technology since recent decades.<sup>34</sup>

In the nineteenth century, the appearance of such inventions as the telegraph, radio, and photography influenced the development of entomology and social interest in insects. New media made it possible to enter an unknown world, to freeze these changing creatures in a still and hear their previously unheard voices. On the other hand, insects inhabited technology, thanks to their Other bodies and Other intelligence, they provided new solutions both in inventions and in the cultural sphere, offering alternatives to anthropocentric thinking and modifying the preexisting cognitive framework. Today, insects are increasingly (co)creating new technologies, and, as Parikka writes, the very metamorphosis, instability, and relational nature of animal forms begin to define contemporary media. Therefore, taking into account the hybridity of insects, an attempt to preserve the “species/genres purity” of the narrative in the analysis seems anachronistic. Insects do not follow media and genre classifications in their stories. Just as flies, ants, and moths they easily penetrate the barrier of the human home and abolish taxonomic boundaries between humans, animals, and even technology, their unnatural narratives should be looked at transmedially.

<sup>32</sup> Parikka, *Insect Media*, XXVII.

<sup>33</sup> Étienne-Jules Marey is considered to be one of the nineteenth-century pioneers of insect media. In his research, Marey dealt with the movement of animals and the interaction of their bodies with space, which translated into reflection on the perception of time. Marey was looking for other non-human forms of perception of reality, which is why he used new media in his experiments, such as chronophotography and miograph. He went further in “animating” technology when in 1869 he constructed an artificial insect for scientific purposes. The results of the research in Marey’s assumptions were to contribute to the progress of humanity and technology conditioned on the circumstances of the life and functioning of insects. Étienne-Jules Marey, *La machine animale. Locomotion terrestre et aérienne* (Paris: G. Ballière, 1873).

<sup>34</sup> Parikka, *Insect Media*, 147.

The assemblage of a machine, an insect and a human, and, at the same time, a tool of becoming-insect, perfectly illustrates another medium of insect narratives—the film. The non-human eye of the lens made it possible to reformulate the framework, adding other narrative tools to the possibilities of literature focused on the word. The connotations of a camera lens or later, a camera with a non-human eye that breaks the perceptual limitations of the viewer and opens them up to a different experience are indicated by Siegfried Zielinski, Walter Benjamin,<sup>35</sup> or Gilles Deleuze. Such a non-anthropocentric view of cinema also appears in the circle of filmmakers. In this context, Parikka recalls the theses of Jean Epstein, the director and screenwriter from the French Impressionist Cinema period: “The cinematographic mode of reality is by definition animism, where the living machine is also a nonhuman eye of such heights, depths, durations, and transmutations as are found through the coupling of nature-cinematography (new media) only.”<sup>36</sup> The lens/non-human eye/focalizer in Epstein’s concept shows analogous possibilities of recombination of the subject and delving into invisible layers of reality brought about by metamorphosis.<sup>37</sup> The already mentioned Deleuze carries out a similar analysis of the film medium:

[The human eye’s—P. F. P.] relative immobility as a receptive organ means that all images vary for a single one, in relation to a privileged image. And, if the camera is considered as apparatus for shooting film, it is subject to the same conditioning limitation. But the cinema is not simply the camera: it is montage. And if from the point of view of the human eye, montage is undoubtedly a construction, from the point of view of another eye, it ceases to be one; it is the pure vision of a non-human eye, of an eye which would be in things. Universal variation, universal interaction (modulation) is what Cezanne had already called the world before man, “dawn of ourselves,” “iridescent chaos,” “virginity of the world.” It is not surprising that we have to construct it since it is given only to the eye which we do not have.<sup>38</sup>

Cinema with the whole spectrum of audiovisual operations, including editing and post-production, which Deleuze draws attention to, forms the correlation described

<sup>35</sup> Walter Benjamin, “The Work of Art in the Age of Mechanical Reproduction,” in *Illuminations: Essays and Reflections*, trans. Harry Zohn (Boston, New York: Mariner Books; Houghton Mifflin Harcourt, 2019).

<sup>36</sup> Parikka, *Insect Media*, 96

<sup>37</sup> A radical change in the narrative perspective is presented in the French documentary *Microcosmos* (1996), where the non-human camera eye that mediates the story-telling takes the role of a microscope.

<sup>38</sup> Gilles Deleuze, *Cinema 1: The Movement-Image*, trans. Hugh Tomlinson and Barbara Habberjam (Minneapolis: University of Minnesota Press, 1986), 81.

by the philosopher as “camera-consciousness.”<sup>39</sup> The film’s non-humanity runs on several levels. We can distinguish here: the individual narrative elements cited by Deleuze, which translate into a deepened, unnatural perception; solutions at the technological and constructional level of the film medium itself—intensifying, approximating, deepening, multiplying; a non-human subject of audiovisual stories. *The Fly* (1986), directed by David Cronenberg, seems to contain all these hybrid elements. The film reinterprets the image of an insect in popular culture, fits into the considerations of becoming-insect, and, at the same time, indicates possible assemblages in modern digital technology.

During the cold war, in the face of the destructive power of the atom, growing unrest and the spectre of a nuclear conflict, insects took over the American cinema. *Them!* (1954), *Tarantula* (1955), *The Beginning of the End* (1957), *The Black Scorpion* (1957), *Monster from Green Hell* (1958), and other film depictions of post-nuclear insects in the 1950s emphasized their radical otherness, looking for their beings from beyond the borders of the Earth. The phobias embodied by cinema were either aliens invading the Earth—modeled on insects, or insects themselves, which destroyed human civilization through delusion, radioactive contamination, or other forms of technologically mediated metamorphosis.<sup>40</sup> The insect in the culture texts of the second half of the twentieth century was presented as an alien, coming from a distant space, inhabiting other outside worlds. The technonature fly, or more specifically the fruit fly, has also taken over science. *Drosophila melanogaster*, due to its ease of breeding and simple structure (it has only four pairs of chromosomes), became the most crucial organism of twentieth-century genetics,<sup>41</sup> and its phenomenon is also recalled in the latest research on artificial intelligence and machine learning.<sup>42</sup>

The biological and symbolic distance between humans and animals is emphasized by the prototype of Cronenberg’s film *The Fly* (1958) by Kurt Neumann. The metamorphosis of Naumann’s protagonist—André—occurs within clearly defined boundaries—as a result of unsuccessful teleportation, his head and arm suddenly change. The viewer is able to point out the precise course of the grotesque border that separates the human and non-human parts of the hybrid. This is not the case in Cronenberg’s remake, where mixing the genome of two species creates a metamorph representing the third order. The main character of the film—Seth Brundle—minimizes his body and sexuality. He is an alienated scientist who lives in his laboratory, isolated from society, and whose life is limited to research. During the

---

<sup>39</sup> Deleuze, *Cinema 1*, 74.

<sup>40</sup> Braidotti, *Metamorphoses*, 150–151.

<sup>41</sup> Steven Connor, *Fly* (London: Reaktion Books, 2006), 151–55.

<sup>42</sup> Piotr F. Piekutowski, “‘Machina ludens.’ Rzeczywista i wyobrażona historia komputerów szachowych,” *Adeptus*, no. 17 (2021), <https://doi.org/10.11649/a.2517>.

teleport experiment, Seth fuses at the genetic-molecular level with a housefly that accidentally ends up in the device. Naked, curled up in the embryonic position, Seth—a posthuman—is born not from a female womb, but a teleport modelled on it, a technological projection.<sup>43</sup> As long as Kafka's *The Metamorphosis* begins with a sudden, incomprehensible conversion of Gregor awakened from a dream, Cronenberg's film shows the becoming-insect as a long and changing path towards hybrid subjectivity. Seth's becoming-insect is a return to an amazing animal, displaced by culture and hidden in the human interior. The metamorphosis restores Seth Brundle, or rather from that moment Brundlefly, lost body and sexuality, relationship with space and other bodies, new perceptual possibilities, even if the protagonist's posthuman physicality, as suggested by Braidotti, is connected with the loss of human control.<sup>44</sup>

Seth: Have you ever heard of insect politics? Neither have I. Insects don't have politics. We can't trust the insect. I'd like to become the first insect politician.

Veronica: I don't know what you're trying to say.

Seth: I'm saying, I'm an insect who dreamt he was a man and loved it. But now the dream is over, and the insect is awake.<sup>45</sup>

In a flash of human consciousness, Seth warns his partner about the lack of control over the change and about going with his fragmented body outside the area of biopolitical power. Like in Kafka's short story, Cronenberg's protagonist is an insect waking up from a dream about a man separated from technonature. Metamorphosis, then, is the realization of the consciousness of evolutionary connection with the animal. In his version, Kurt Neumann presents this problem in a well-known scene, changing the camera's point of view from an outside observer to the non-mediated perspective of the character-metamorph. The image seen from the first person through the insect-eye camera multiplies the identity of the protagonist's wife, Hélène, who is being watched.

Technology in Cronenberg's narrative is not only non-human; it is the only possible intermediary in becoming-animal. Seth's metamorphosis begins with teleportation, supervised by a computer program whose task is to restore the biological organism after its dematerialization. But technology reveals its insect nature even earlier, when in the scene before the transformation, the microprocessor accidentally injures the protagonist, somehow infecting him with an insect. It is at the skin site cut by the microprocessor where the first hairs appear. A small device in the

<sup>43</sup> Clarke, *Posthuman Metamorphosis*, 150.

<sup>44</sup> Braidotti, *Metamorphoses*, 248.

<sup>45</sup> David Cronenberg, dir., *The Fly* (20th Century Fox, 1986).

film plays the role of a spider biting Peter Parker, which transforms it into a human-animal hybrid—Spider-Man. Insects are technology. This can also be seen in the last scene of the film, when Brundlefly, in full insect form, finally crosses the teleport, giving the hybrid human-insect-machine form. Becoming-insect also begins on the computer screen, as it tries to inform the protagonist that the transformation has started, and in a later scene, it does not recognize Seth's new non-human voice:

ERROR—PATTERN MISMATCH  
 VOICE NOT RECOGNIZED  
 VOICE NOT RECOGNIZED  
 VOICE NOT RECOGNIZED...<sup>46</sup>

As Steven Connor notes, while he traces the cultural and entomological history of the fly, the sound produced by this insect is equated with meaningless speech, and the etymology of its species name also applies to it in many languages.<sup>47</sup> The loss of the human voice, along with the disintegration of the old body, is the most significant stage in becoming-insect, be it in Cronenberg's audiovisual narrative or in the Kafka's story. This places a metamorph in Cartesian animality—devoid of speech and logical thinking. In this context, metamorphosis is not the loss of voice but the loss of the hegemonic *logos* associated with the anthropocentric perception of reality. The missing *logos* is filled with the returning animal. "Voices are calling. They urge to awaken to reality and bring to order."<sup>48</sup> Tadeusz Ślawek bases his in-depth interpretation of Kafka's *The Metamorphosis* on the lost voice ability of Gregor Samsa, who in the text experiences the human reality of the family, but also the space of the home, mainly through voices and sounds.

In *The Fly*, a detail on a monitor connected to a teleport that fills the entire frame can be read as a cinema or television screen, changing the perception of the recipients of the twentieth-century media to the perspective of insects. The whole story of the transformation is mediated through the non-human eye of the camera, which in the case of Cronenberg's film coincides even more with Connor's words: "It is the fly's eye that is emblematic of the radically alien mode of entomological vision."<sup>49</sup> Literature, photography, and then film brought a deepened experience of reality and built their own diegetic transformation languages. Similarly, the latest engaging and networked media have entered an endless loop of hybrid changes, drawing on insect worlds.

<sup>46</sup> Cronenberg, dir., *The Fly*.

<sup>47</sup> Connor, *Fly*, 172.

<sup>48</sup> Ślawek, *Śladem zwierząt. O dochodzeniu do siebie*, 99.

<sup>49</sup> Connor, *Fly*, 82–83.

## Let's Swarm! Networked Metamorphs

Kurt Wolff and Ottomar Starke fulfilled Franz Kafka's postulate that the non-human character should not be represented. Such a restriction was to ensure the ambiguity of the nature of Gregor the worm, because after the protagonist was transferred to the visual medium, polysemy would have to give way to a certain concretization. However, more than a hundred years after the first edition of *The Metamorphosis*, while browsing contemporary re-editions, we can see that no publisher remembers the writer's appeal anymore. Gregor's visual interpretations of becoming-animal, contrary to Kafka's fears, often continued the writer's exploration of non-human experiences. Herman argues that this is the case, for example, with the representations of the adaptation of *The Metamorphosis* in comics. Thanks to unique narrative measures, the visual-verbal medium has transformed animal geographies into bio-centric rather than anthropocentric categories.<sup>50</sup> A similar situation can be seen in new, more immersive technological media—video games and VR (Virtual Reality).

In 2018, the Goethe-Institut in Prague realized the virtual installation *VRwandlung*<sup>51</sup> directed by Mika Johnson, in which the user could use VR technology to repeat Gregor's unnatural experience. Artists and programmers, based on literary descriptions, accurately reproduced the space of the Samsa house visually and soundly. The player wakes up locked in Gregor's room and takes control of a transformed body from a first-person perspective. In his account of virtual experience, Tomáš Moravec emphasizes the act itself that prepares for unnatural experience:

Just as I've slipped into the cosy slippers with odd sensors attached to the tips, I am equipped further with headphones, hand motion controllers and, of course, virtual reality glasses. Thus equipped and wired up, I wait a few seconds in absolute darkness. Then it begins: A light flashes on and I find myself in 1915, in Gregor Samsa's room in the Old Town of Prague and in a completely different body.<sup>52</sup>

The steps leading up to the actual simulation are similar to constructing a cyborg hybrid. They are the metamorphosis that has taken place. The following levels of connecting the player to the technology decentralize his human body: VR goggles, headphones, motion controllers placed in the hands, external cameras and absolute darkness are the realization of assemblage, becoming-insect. The adopted techno-

<sup>50</sup> Herman, *Narratology Beyond the Human*, 130–34.

<sup>51</sup> Mika Johnson, dir., *VRwandlung* (The Goethe-Institute Prague, 2018).

<sup>52</sup> Tomáš Moravec, "Kafka in Virtual Reality," trans. Faith Ann Gibson, *Goethe-Institut*, 2018, accessed January 13, 2022, <https://www.goethe.de/en/uun/pub/akt/g18/21150235.html>.

logical objects are themselves a figuration of a twisted insect clothed in chitin—postmodernity Gregor.

When writing about virtual transformations in *ungeheuren Ungeziefer*, monstrous vermin embedded in Kafkaesque reality, one should recall the video game and VR of the Polish studio All in! Games *Metamorphosis* (2020)<sup>53</sup> inspired not only by the story from which it borrowed the title but also by Kafka's *The Trial*. The project is based on similar assumptions as *Vrwandlung*—it allows the player to play the role of Gregor. The narrative is carried out from the first person's perspective, and the protagonist's verbalized internal narrative complements the image. The story begins after waking up in Josef K.'s house. Initially, when the player leaves the room, he controls the human avatar, but each subsequent room changes the perspective, lowering the protagonist's point of view. This is the first symptom of the transformation that has begun; the next stage is noticeable in the photographic medium—the photos of Gregor and Josef hanging in the corridor, together with the player's movement, change into images of arthropods or annelids. Passing through the oneiric, defamiliarized spaces of the house, the protagonist gains the ability to move faster, the corridor smoothly turns into a ventilation shaft, black insect fringes appear, for the finale of the prologue, the protagonist-narrator announced in a modulated voice: "I know this sounds ludicrous... but can it be... that I'm... a bug?"<sup>54</sup> As the story progresses, the recognizable human voice of the narrator gives way to the sounds of insects, the content of which is translated to the player in the form of subtitles. "[T]he process of becoming is a transformation in terms of a qualitative increase (in speed, intensity, perception or colour) that allows one to break into new fields of perception, affectivity, becoming."<sup>55</sup>

Becoming-insect both provokes a change in space and intensifies the relationship with it. The player can not only move inside walls, ceilings or furniture, climb vertical and suspended surfaces, but also leave behind a trail resembling pheromone routes created by insects for communication and used in modern cybernetics, as Parikka notes, for (re)constructing by ant-based network algorithms (virtual and web).<sup>56</sup> Interestingly, the first-person perspective of the metamorph in the game does not take into account the visual perception of the pheromone trails left behind; their visual transposition takes place only when the perspective is changed to a total plan—prepared for the human properties of the player's eye. Only then is a clear, shimmering trace visible, which allows you to track the travelled path and, on its basis, plan further exploration, avoid an obstacle or successfully solve a problem. In the world of insects, pheromones are the medium of communication. In swarms

<sup>53</sup> *Metamorphosis* (All in! Games, 2020).

<sup>54</sup> *Metamorphosis* (All in! Games, 2020).

<sup>55</sup> Braidotti, *Metamorphoses*, 147.

<sup>56</sup> Parikka, *Insect Media*, 161.

they are one of the essential elements of the network—a chemical and variable narrative that integrates individuals and the environment into a superorganism.<sup>57</sup> In *Metamorphosis*, pheromones remain the digital medium of communication between the human and non-human perspective.

Even Johan Huizinga and later Roger Caillois emphasized the relationality of games and new technological media beyond humans and above all, the presence of the game in the animal world, including insects. In his research, Caillois cites, among other things, the phenomenon of mimicry of butterflies and mantis, thus, a morphological change through the interaction of affects, which for the scientist is equal to new media, including photography.<sup>58</sup> In the context of mimicry games-simulators like *Shelter* (2013), *Bee Simulator* (2019) or *Bear Simulator* (2016), which are intended to imitate non-human life as realistically as possible, could be considered a medium close to perfection in the experience of becoming-animal. For Marco Caracciolo, the game's possibilities of a more immersive illusion do not necessarily translate into their posthumanist sensitivities.

Videogames that flaunt the possibility of “becoming animal” are thus fundamentally ambivalent: depending on both game design choices and the interpreter's predispositions, they can perform a critique of anthropocentric assumptions or evoke an ethically problematic sense of control over the nonhuman.<sup>59</sup>

Animal video games emphasizing their realism, as Caracciolo argues, can provoke a sense of human control, leaving no room for defamiliarization, the amazement of the Other or the agency of non-human actants that are present in unnatural games or animal mayhem games. Parikka, similar to Caracciolo, notes the potential danger of grounding the anthropocentric paradigm when writing about the presence of insect assemblages in advanced virtual technology and the digital possibilities it produces for becoming-insects. Software and interfaces, by privileging the human player, create the illusion of having control and power over the non-human.<sup>60</sup> Other insect affects—swarms—elude human control.

In ecohumanism and posthumanism, the figure of the swarm and the resulting act of delusion became the carriers of new ideas. “The swarm is a becoming that expresses potentialities that are always situated and yet moving.”<sup>61</sup> The scat-

<sup>57</sup> Parikka, *Insect Media*, 153.

<sup>58</sup> Roger Caillois, “Mimicry and Legendary Psychasthenia,” in *The Edge of Surrealism: A Roger Caillois Reader*, trans. Claudine Frank and Camille Naish, (Durham: Duke University Press, 2003), 96.

<sup>59</sup> Marco Caracciolo, “Animal Mayhem Games and Nonhuman-Oriented Thinking,” *Game Studies* 21, no. 1 (2021), accessed January 13, 2022, <http://hdl.handle.net/1854/LU-8704764>.

<sup>60</sup> Parikka, *Insect Media*, 157.

<sup>61</sup> Parikka, *Insect Media*, 49.



tering and decentralization of the transformed posthuman bodies in a swarm is an open project, becoming together with the environment. The affective hive politics, self-organization and collective intelligence of the early twentieth century were translated by Maurice Maeterlinck by the concept of the “beehive spirit” that governs the functioning of the family.<sup>62</sup> In the second half of the twentieth century, along with the advancing computerization, work on new means of communication, the Internet and artificial intelligence, cyberneticists began to rediscover insects, transferring them to the world of digital—in the form of bioids or biomorphs. Today, scattered insect systems and population thinking have infiltrated both posthumanism and technological media. In computer networks, non-human algorithms use insect-based solutions—they see single digital paths as coordinate systems that, when superimposed on space, allow them to find themselves, better organize the whole system and more effectively react to new problems in space.<sup>63</sup> James Newman notices similar non-human mechanisms in the game medium. The interactivity of video games translates into the intensification of affects—the relationality of the player’s connections with all actants of the gameworld brings this experience closer to the self-organization of the swarm. “[P]layer may not see themselves as any one particular character on the screen, but rather as the sum of every force and influence that comprises the game.”<sup>64</sup>

A swarm is not only a becoming-insect structure. In anthropocentric thinking, fantasizing is an undesirable possibility. It generates economic losses, is dangerous and, most importantly, means losing human control over nature.<sup>65</sup> However, an ambivalent attitude to the swarm also appears in posthuman or feminist research. Lauren Wilcox sees the realized possibilities of swarm and dreaming primarily in the military sphere, centralized power, or, referring to the term created by Jasbir K. Puar, “homonationalism.”<sup>66</sup> “Rather than serving as an inspiration for egalitarian feminist utopias, the metaphor and materiality of the swarm has been appropriated

<sup>62</sup> Maurice Maeterlinck, *The Life of the Bee*, trans. Alfred Sutro (New York: Mentor Book, 1954), 27.

<sup>63</sup> For example, the constructive and affective actions of termites were read by Edward O. Wilson as “dynamic programming.” Steven Levy, *Artificial Life: A Report from the Frontier Where Computers Meet Biology* (New York: Vintage Books, 1992), 105.

<sup>64</sup> James Newman, “The Myth of the Ergodic Videogame: Some Thoughts on Player-character Relationships in Videogames,” *Game Studies* 2, no. 1 (2002), accessed January 13, 2022, <http://www.gamestudies.org/0102/newman/>.

<sup>65</sup> Michaela Fenske argues that the negative character of the swarm in culture is changing. In the face of the ecological crisis, a positive reevaluation is gradually taking place, which the researcher shows in the example of the semantic evolution of a swarm in beekeeping. Michaela Fenske, “Narrating the Swarm: Changing Metanarratives in Times of Crisis,” *Narrative Culture* 4, no. 2 (2017), accessed January 13, 2022, <https://doi.org/10.13110/narrcult.4.2.0130>.

<sup>66</sup> Jasbir K. Puar, *Terrorist Assemblages: Homonationalism in Queer Times* (Durham: Duke University Press, 2007).

for distinctly dystopian war-fighting purposes.”<sup>67</sup> Modern military technologies based on non-linear self-organization of the swarm, such as drones, have become models for future military conflicts. Concerns about the use of insects in the design of a distributed system of violence confirm that nature is not a ready-made composition of technological patterns, but rather a set of ideas.<sup>68</sup> The assemblage of the swarm as an insect-machine-human hybrid and the accompanying divergent discourses resemble the figure of the cyborg by Donna Haraway,<sup>69</sup> who only in a breakthrough reinterpretation of the researcher revealed possibilities not noticed in the earlier frames.

## Conclusion

“Nonsense is the entomologist’s dream come true.”<sup>70</sup> Narratives about becoming-insect from a rational and realistic perspective become records of madness, the decay of the subject, and do not fit into the cognitive scenarios of events. In other words, they are non-human nonsense, which can also be read as waking up from a dream of a human being. Deterritorialized, swarming, and cross-linked—these are their only constants. Insects always remain “in-between,” elusive in their mutating form, are seen by posthumanism as figurations decentralizing the anthropocentric discourse and bringing hope for building relational sensitivities.<sup>71</sup> Non-human perceptions, as Deleuze argues after Henri Bergson, open up new worlds of receiving impressions.<sup>72</sup> Literature, photography, film, the web, video games or virtual reality offer different transmedial possibilities of experiencing and narrating a metamorphosis. These ontological and story-telling potentials of transposition are mediated by technology that, from an archaeological perspective, reveals hybrid connections with both the human and animal world. Technological media are more than a bridge into becoming-insect; through biotechnological solutions, they set

---

<sup>67</sup> Lauren Wilcox, “Drones, Swarms and Becoming-Insect: Feminist Utopias and Posthuman Politics,” *Feminist Review* 116, no. 1 (2017): 41, <https://doi.org/10.1057/s41305-017-0071-x>.

<sup>68</sup> Parikka, *Insect Media*, XIV.

<sup>69</sup> Donna J. Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-feminism in the Late Twentieth Century,” in *Simians, Cyborgs and Women: The Reinvention of Nature* (New York, London: Routledge, 1991).

<sup>70</sup> Jean-Jacques Lecercle, *Philosophy of Nonsense: The Intuitions of Victorian Nonsense Literature* (London: Routledge, 1994), 204.

<sup>71</sup> Braidotti, *Metamorphoses*, 149.

<sup>72</sup> Gilles Deleuze, *Bergsonism*, trans. Hugh Tomlinson and Barbara Habberjam (New York: Zone Books, 1991), 28.

the track for further metamorphoses, “we do not so much *have* media as we *are* media and *of* media.”<sup>73</sup>

## Bibliography

- Alber, Jan. *Unnatural Narrative: Impossible Worlds in Fiction and Drama*. Lincoln: University of Nebraska Press, 2016.
- Benjamin, Walter. “The Work of Art in the Age of Mechanical Reproduction.” In *Illuminations: Essays and Reflections*. Translated by Harry Zohn. Boston, New York: Mariner Books; Houghton Mifflin Harcourt, 2019.
- Braidotti, Rosi. *Metamorphoses: Towards a Materialist Theory of Becoming*. Cambridge, Malden, MA: Polity, 2002.
- Brown, Eric C. “Reading the Insect.” In *Insect Poetics*, edited by Eric C. Brown. Minneapolis: University of Minnesota Press, 2006.
- Caillois, Roger. “Mimicry and Legendary Psychasthenia.” In *The Edge of Surrealism: A Roger Caillois Reader*. Translated by Claudine Frank and Camille Naish. Durham: Duke University Press, 2003.
- Caracciolo, Marco. “Animal Mayhem Games and Nonhuman-Oriented Thinking.” *Game Studies* 21, no. 1 (2021). Accessed January 13, 2022. <http://hdl.handle.net/1854/LU-8704764>.
- Clarke, Bruce. *Posthuman Metamorphosis: Narrative and Systems*. New York: Fordham University Press, 2008.
- Connor, Steven. *Fly*. London: Reaktion Books, 2006.
- Corngold, Stanley. “Thirteen Ways of Looking at a Vermin: Metaphor and Chiasm in Kafka’s *The Metamorphosis*.” *Literary Research / Recherche Littéraire* 21, no. 41–42 (2004): 59–85.
- Cronenberg, David. *The Fly*. 20th Century Fox, 1986.
- Deleuze, Gilles. *Cinema 1: The Movement-Image*. Translated by Hugh Tomlinson and Barbara Habberjam. Minneapolis: University of Minnesota Press, 1986.
- Deleuze, Gilles. *Bergsonism*. Translated by Hugh Tomlinson and Barbara Habberjam. New York: Zone Books, 1991.
- Deleuze, Gilles, and Félix Guattari. *A Thousand Plateaus: Capitalism and Schizophrenia*. Translated by Brian Massumi. London: Bloomsbury, 2013.
- Fenske, Michaela. “Narrating the Swarm: Changing Metanarratives in Times of Crisis.” *Narrative Culture* 4, no. 2 (2017): 130–152. Accessed January 13, 2022. <https://doi.org/10.13110/narrcult.4.2.0130>.
- Haraway, Donna J. “A Cyborg Manifesto: Science, Technology, and Socialist-feminism in the Late Twentieth century.” In *Simians, Cyborgs and Women: The Reinvention of Nature*, 149–181. New York, London: Routledge, 1991.

<sup>73</sup> Parikka, *Insect Media*, XXVII.

- Herman, David. *Narratology Beyond the Human: Storytelling and Animal Life*. New York: Oxford University Press, 2018.
- Johnson, Mika. *VRwandlung*. The Goethe-Institute Prague, 2018.
- Kafka, Franz. *Letters to Friends, Family, and Editors*. Translated by Richard Winston and Clara Winston. New York: Schocken, 1977.
- Kafka, Franz. *The Metamorphosis: Translation, Backgrounds and Contexts Criticism*. Translated by Stanley Corngold. New York, London: W. W. Norton & Company, 1996.
- Lecerclé, Jean-Jacques. *Philosophy of Nonsense: The Intuitions of Victorian Nonsense Literature*. London: Routledge, 1994.
- Levy, Steven. *Artificial Life: A Report from the Frontier Where Computers Meet Biology*. New York: Vintage Books, 1992.
- Mackenzie, Adrian. *Transductions Bodies and Machines at Speed*. London, New York: Continuum, 2002.
- Maeterlinck, Maurice. *The Life of the Bee*. Translated by Alfred Sutro. New York: Mentor Book, 1954.
- Marey, Étienne-Jules. *La machine animale. Locomotion terrestre et aérienne*. Paris: G. Ballière, 1873.
- Metamorphosis*. All in! Games, 2020.
- Moravec, Tomáš. "Kafka in Virtual Reality." Translated by Faith Ann Gibson. *Goethe-Institut*, 2018. Accessed January 13, 2022. <https://www.goethe.de/en/uun/pub/akt/g18/21150235.html>.
- Newman, James. "The Myth of the Ergodic Videogame: Some Thoughts on Player-Character Relationships in Videogames." *Game Studies* 2, no. 1 (2002). Accessed January 13, 2022. <http://www.gamestudies.org/0102/newman/>.
- Parikka, Jussi. *Insect Media: An Archaeology of Animals and Technology*. Minneapolis: University of Minnesota Press, 2010.
- Piekutowski, Piotr F. "Machina ludens? Rzeczywista i wyobrażona historia komputerów szachowych." *Adeptus*, no. 17 (2021). <https://doi.org/10.11649/a.2517>.
- Puar, Jasbir K. *Terrorist Assemblages: Homonationalism in Queer Times*. Durham: Duke University Press, 2007.
- Raffles, Hugh. *Insectopedia*. New York: Pantheon Books, 2010. EPUB.
- Ryan, Marie-Laure. *Possible Worlds, Artificial Intelligence, and Narrative Theory*. Bloomington: Indiana University Press, 1991.
- Schank, Roger C., and Robert P. Abelson. *Scripts, Plans, Goals, and Understanding: An Inquiry into Human Knowledge Structures*. Hillsdale, NJ, New York: L. Erlbaum Associates, 1977.
- Sławek, Tadeusz. *Śladem zwierząt. O dochodzeniu do siebie*. Gdańsk: Fundacja Terytoria Książki, 2020.
- Swinford, Dean. "The Portrait of an Armor-Plated Sign: Reimagining Samsa's Exoskeleton." In *Kafka's Creatures: Animals, Hybrids, and Other Fantastic Beings*, edited by Marc Lucht and Donna Yarri, 211–236. Lanham, MD: Lexington Books, 2012.
- Wilcox, Lauren. "Drones, Swarms and Becoming-Insect: Feminist Utopias and Posthuman Politics." *Feminist Review* 116, no. 1 (2017): 25–45. <https://doi.org/10.1057/s41305-017-0071-x>.

- Zielinski, Siegfried. *Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means*. Electronic culture. Cambridge, MA: The MIT Press, 2006.
- Żółkoś, Monika. "Mikro-formy i makro-lęki. Owady jako wyzwanie dla animal studies." In *Zwierzęta i ich ludzie: Zmierzch antropocentrycznego paradygmatu*, edited by Anna Barcz and Dorota Łagodźka, 34–45. Warszawa: Wydawnictwo Instytutu Badań Literackich PAN, 2015.

**Piotr F. Piekutowski** – magister, doktorant literaturoznawstwa w Szkole Doktorskiej Uniwersytetu Śląskiego w Katowicach, pszczelarz. W ramach realizowanej pracy badawczej zajmuje się problematyką narracji nieantropocentrycznych w polskiej literaturze XX i XXI wieku. Jego najnowsze publikacje ukazały się między innymi w czasopismach „Zagadnienia Rodzajów Literackich”, „Adeptus”, „Przegląd Kulturoznawczy” czy w monografii *Fragmenty dyskursu żałobnego* (Gdańsk 2021). Redaktor zbioru opowiadań *Pozaświat. Studencka antologia tekstów nie-ludzkich* (Katowice 2021).

**Piotr F. Piekutowski** – MA, PhD candidate in literary studies at the Doctoral School of The University of Silesia in Katowice, beekeeper. As part of his research work, he examines non-anthropocentric narratives in Polish literature of the twentieth and twentieth-first centuries. His latest publications appeared, among others, in the journals *Zagadnienia Rodzajów Literackich*, *Adeptus*, *Przegląd Kulturoznawczy*, and in the monograph *Fragmenty dyskursu żałobnego* [Mourning Discourse: Fragments] (Gdańsk 2021). Editor of the collection of short stories *Pozaświat. Studencka antologia tekstów nie-ludzkich* [Other-World. Students' Anthology of Non-Human Fiction] (Katowice 2021).