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# Rethinking the Essence of Human and Other-Than-Human Communication in the Anthropocene Epoch: A Biosemiotic Interpretation of Edgar Morin's "Complex Thought"

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**Abstract:** The purpose of this essay is to explore the philosophical and linguistic implications of the French philosopher Edgar Morin's "complex thought." In stark contrast to standard communicative models which profess that *Homo sapiens* are the only organisms that are capable of engaging in semiosis, Morin unequivocally proves that other-than-human communication is laden with significance and purpose. Living on an imperiled planet that is increasingly defined by an anthropogenic, ecological calamity that is spiraling further out of control with each passing day, Morin persuasively argues that we must transcend our myopic, anthropocentric frame of reference and adopt a more ecocentric view of communication.

**Keywords:** Edgar Morin; Biosemiotics; non-human communication; semiosis; biocentrism; Anthropocene epoch

## 1. Introduction

A salient feature of Edgar Morin's "complex thought" is his conviction that the essence of communication is much more nuanced than traditional linguistic paradigms suggest. Morin posits that the entire universe is teeming with purposeful and meaningful semiosis occurring at all biological levels of organization. Heavily influenced by the groundbreaking discoveries of the biologist Jakob von Uexküll, identified by many researchers as the "founding father of Biosemiotics," the philosopher underscores the significance of the varying types of communication that transpire all throughout the biosphere.<sup>1</sup> Morin maintains that the "biological revolution" set into motion by von Uexküll should have also led to a philosophical evolution regarding how we think about the exchange of signs.<sup>2</sup> Specifically, Morin takes aim at the pervasive, anthropocentric logic in Western civilization that creates an ontological distinction between "semiotically active humans and a semiotically inactive nature."<sup>3</sup>

Morin explains that all organisms possess "informational capital,"<sup>4</sup> the complexity of which is determined by the semiotic capabilities of the given species in question, which enables them to conceive mental models for representing the world and their relationship to it. Not only are *Homo sapiens* fully immersed in a universe replete with other "semiotic agents," but Morin also asserts that biocentric insights related to non-human semiosis implore us to confer the status of subjecthood upon the entire

<sup>1</sup> (Barbieri 2007, p. 102).

<sup>2</sup> (Morin 1980, p. 124). All English translations from *La Méthode* are my own unless otherwise indicated.

<sup>3</sup> (Maran 2014, p. 142).

<sup>4</sup> (Morin 1980, p. 131).

biotic community of life.<sup>5</sup> By probing the nature of informational exchanges inside of a species-specific *Umwelt*, the philosopher demonstrates that it is vital to preserve all of these sign-systems upon which our continued existence depends. In the current Anthropocene epoch epitomized by a thick layer of human semiosis that serves to conceal an anthropogenic crisis of epic proportions, Morin contends that this reexamination of communication is an urgent matter of life and death.

## 2. Communication is a Universal Property of Life

Based upon the findings of von Uexküll and those who followed in his footsteps, Morin affirms that communication is a universal property of life all throughout his multi-volume work *Method*. Deriving philosophical inspiration from the main premise of Biosemioticians that “all life—from the cell all the way up to us—is characterized by communication, or semiosis,” the philosopher dismisses anthropocentric, linguistic systems that fail to take into account the veritable complexity of other-than-human semiosis.<sup>6</sup> Moreover, in an article entitled “How Cells Communicate, Part 2: Sending and Receiving Signals,” the scientist Laurie Endicott Thomas (Thomas 2017) confirms the biosemiotic premise that significant and deliberate semiosis occurs on a cellular level. Similar to the semiotician Yuri Lotman, Morin reaches the conclusion that the “semiosphere [ . . . ] coincides with the biosphere [ . . . ] life and semiosis are one and the same.”<sup>7</sup> Instead of being a uniquely human trait, as proponents of human exceptionalism claim, Morin insists that “signs and communication belong to the whole of the organic world.”<sup>8</sup> The philosopher attempts to shed light on all of the transdisciplinary implications of these new “studies in biology” that debunk centuries of Homocentric linguistic and philosophical thought.<sup>9</sup> As opposed to being the only organisms that possess the ability to communicate through signs deliberately and strategically, Morin explains that *Homo sapiens* are imbricated in a “vast global web of semiosis encompassing all living things.”<sup>10</sup>

Clearly adopting a biosemiotic perspective, Morin declares, “Thus, each living being is a transmitter/receiver. A network of communications [ . . . ] is woven together [ . . . ] these networks overlap [ . . . ] in a sort of polynetwork [ . . . ] that constitutes in short this web [ . . . ] the communicative tissue of eco-organization [ . . . ] Instead of emanating from a post of transmission, it emanates from everywhere and from all of its receivers.”<sup>11</sup> For Morin, it is the incessant exchange of information from all biological levels of organization that binds the resin of life together on an interdependent and interconnected planet. In this passage, the philosopher highlights the scientific viewpoint that “this communicative tissue” constitutes the threads that are emblematic of the delicate web of existence. Criticizing dominant linguistic theories in Western civilization that minimize the importance of non-human types of semiosis, the philosopher argues that all life forms create, send, receive, and interpret signs. According to Morin, the ubiquity of human communication is a microcosmic reflection of a universal characteristic that defines existence on this biosphere-semiosphere.

Furthermore, Morin asserts that abundant life on this planet would cease to exist if this omnipresent semiosis were to end abruptly. In this regard, the philosopher links this continuous exchange of signs occurring throughout the biosphere with the “uninterrupted necessity of protecting one’s own existence” in a hostile universe in which every creature tries to stave off the forces of death for as long as possible.<sup>12</sup> As Morin theorizes, “with every living being, this auto-organization computes, controls, regulates, and corrects self-organizational processes inherent inside of it; if these physical

<sup>5</sup> (Barbieri 2007, p. 107).

<sup>6</sup> (Wheeler 2011a, p. 270).

<sup>7</sup> (Kull 2007, p. 168).

<sup>8</sup> (Petrilli and Ponzio 2013b, p. 374).

<sup>9</sup> (Ibid., p. 374).

<sup>10</sup> (Wheeler 2014a, p. 71).

<sup>11</sup> (Morin 1980, p. 38).

<sup>12</sup> (Ibid., p. 161).

processes didn't exist, it couldn't exist."<sup>13</sup> The philosopher describes each organism as a self-regulating entity that is capable of adapting to its surroundings and anticipating potential threats by interpreting natural signs and intentionally disseminating relevant information connected to the survival of the species in question. In his analysis of Morin's deconstruction of nature-culture dualism in *Homeland Earth*, Kerry Whiteside notes that even rudimentary unicellular organisms respond communicatively to "environmental changes like temperature variation or population growth."<sup>14</sup> Whiteside further clarifies that all species possess "the ability to mobilize certain functions" in response to a perceived danger.<sup>15</sup> In his essay "Cosmophy," Santa de Siena avers that "every living entity endowed with a nervous system" takes advantage of its semiotic capabilities to prolong its existence.<sup>16</sup>

After offering concrete examples of the "extremely varied range of signs or signals (olfactory, audible, and gestural)" that is indicative of other-than-human kinds of semiosis including the honeybee waggle dance language that has been studied by numerous researchers such as Eileen Crist, Christoph Grüter, and Walter Farina,<sup>17</sup> Morin directly associates communication with survival.<sup>18</sup> In the context of the unavoidable parasitism that forces all species to take from the earth in order to sustain their existence, the philosopher asserts that information is both a defense mechanism and a weapon. Depicting the semiosphere as an informational battlefield comprised of the overlapping signs emitted by predator and prey, Morin claims,

In fact, predator and prey have a vital need for information about each other, and both of them have a vital need to not disseminate information to the other, both of them strive to conceal themselves from each other, the first one to approach his prey without being detected, the second to escape the perception of his predator [ . . . ] Thus, this competition between intelligent individuals consists of an informational battle, where it is about extracting the maximum amount of information about one's enemy, all the while emitting foggy noise and pseudo-information (p. 3).

In this section of the essay dedicated to the ecological interactions that transpire on a regular basis within the parasitic Chain of Being from which there is no escape, the philosopher explains that the incapacity to decipher natural signs and to engage in semiosis can have deadly consequences. Although many people consider other-than-human semiosis to be nothing more than insignificant background noise, Morin maintains that non-human communication is both meaningful and strategic. In addition to warning other members of their community about the presence of a predator, other organisms skillfully manipulate semiotic codes to mislead other species that wish to harm them. In this vein, contemporary studies related to the surprising complexity of "VOC-based plant communication" or "VOC signals"<sup>19</sup> emitted by several species of plants for the sake of self-preservation give credence to Morin's theories.<sup>20</sup> The philosopher contends that the sophistication of these sign-systems including the large amount of information being exchanged far transcends "fight or flight" behavior. From an evolutionary standpoint, the mere act of survival is what fosters the development of fine-tuned, semiotic vectors for transmitting, receiving, retrieving, interpreting, and stockpiling information. For this reason, Morin concludes that semiosis is everywhere because life could not exist otherwise. The philosopher unequivocally demonstrates the limitations of conventional linguistics and semiotics for placing

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<sup>13</sup> (Ibid., p. 257).

<sup>14</sup> (Whiteside 2004, p. 361).

<sup>15</sup> (Ibid., p. 361).

<sup>16</sup> (De Siena 2005, p. 413).

<sup>17</sup> (Crist 2004; Grüter and Farina 2009).

<sup>18</sup> (Morin 1980, p. 37).

<sup>19</sup> I am referring to Volatile Organic Compounds. Providing an operational definition for this concept, Hirokazu Ueda, Yukio Kikuta, and Kazuhiko Matsuda reveal, "Plants emit volatile organic compounds (VOCs) as a means to warn other plants of impending danger. Nearby plants exposed to the induced VOCs prepare their own defense weapons in response" (Ueda et al. 2012, p. 22).

<sup>20</sup> (Arimura and Pearse 2017, p. 3).

human semiosis back into its proper evolutionary context as the by-product of an indiscriminate universe in which signs continually intersect and bifurcate in all directions.

### 3. (Re-)Conceptualization of a More Ecocentric and Comprehensive Paradigm of Communication

In order to outline the basic parameters of what the (re-)conceptualization of a more ecocentric and comprehensive model of communication would entail, Morin underscores the importance of the recent scientific breakthroughs that are at the core of biosemiotic thought. The philosopher affirms that these fundamental principles, which have been confirmed by contemporary scientific erudition, could represent an invaluable point of departure leading to a radical paradigm shift regarding how we think about communication. Influenced by what “Gunther Stent called the Information School of molecular biology” that united biologists and physicists in the middle of the twentieth century in an effort to understand both the essence of existence and communication more fully, Morin posits that the very structure of DNA itself is communicative.<sup>21</sup> Given that everything is comprised of these basic building blocks, each life form appears to be hardwired for the exchange of information. This particular biosemiotic insight refutes the mechanistic view of other-than-human entities that has relegated all other organisms to the status of “pre-programmed puppets.”<sup>22</sup> Citing the biologist James Shapiro, Wendy Wheeler explains, “It appears that DNA code is [ . . . ] not a mechanical but a semiotic and thus interpretative phenomenon in which cells (and bodies and organisms) have learned to make many context-dependent meanings.”<sup>23</sup> Far from being mindless automatons that operate according to an internal machinery, other creatures confront unanticipated challenges by processing and disseminating signs that are paramount to their survival. In other words, all species are “bearers of purposes and readers of meaning.”<sup>24</sup> Not only do other beings engage in constant semiosis, but they also react on the basis of the information that they receive and decode.

In his reflections concerning the philosophical and linguistic value of James Watson and Francis Crick’s findings about the chemical structure of DNA, Morin muses, “The uncovering of the chemical and informational nature of genes constitutes one of the most extraordinary discoveries of modern science [ . . . ] Following Avery’s work (1946) and that of Crick and Watson (1953), genes were identified as segments of a DNA macromolecule and conceived as coded messages carrying information.”<sup>25</sup> The philosopher reiterates, “Genetic capital thus amassed is arranged according to a chemical system of quasi-signs, constituting a language.”<sup>26</sup> In these passages, Morin hypothesizes that genetic capital is synonymous with informational capital. Regardless of the exact chemical composition of a certain species determined by DNA sequencing, the philosopher emphasizes the communicative nature of all genetic codes. Morin reminds us that DNA sequences are converted into messages, thereby enabling “The program [ . . . ] a group of coded instructions” to be executed resulting in the creation of proteins.<sup>27</sup> The philosopher stresses that the ability to read and interpret signs is what renders existence possible. Morin contends that what scientists commonly refer to as “translational decoding” is a hallmark of life in all of its divergent forms.<sup>28</sup> Hence, the plethora of information exchanged inside of every sign-system is laden with meaning. According to Morin, the discovery of DNA delivers the final *coup de grâce* to outdated communicative paradigms that focus solely on human forms of semiosis. The new theoretical framework proposed by the philosopher for reworking the complex nuances of communication from a biocentric angle begins with the recognition that “semiosis is synonymous with

<sup>21</sup> (Pattee and Kull 2009, p. 326).

<sup>22</sup> (Barbieri 2007, p. 108).

<sup>23</sup> (Wheeler 2014b, p. 122).

<sup>24</sup> (Ibid., p. 122).

<sup>25</sup> (Morin 1980, p. 115).

<sup>26</sup> (Ibid., p. 115).

<sup>27</sup> (Ibid., p. 224).

<sup>28</sup> (Westhof 2014, p. 2464).

life.<sup>29</sup> Morin promotes a kind of “ecologised thought” that represents a starting point for the creation of a model designed to provide a more scientifically accurate and complete picture of communication.<sup>30</sup>

In addition to research related to the chemical structure of DNA and its communicative properties, Morin is fascinated with studies dedicated to unicellular organisms including bacteria. Several passages of *La Méthode* are evidently inspired by his understanding of endosemiotics, “an even more ambitious project” conceived by Jakob von Uexküll’s son Thure von Uexküll.<sup>31</sup> Further developing his father’s key concepts, Thure von Uexküll devoted his time to “the study of trains of sign transmission inside the organism.”<sup>32</sup> Intrigued by the myriad of chemical and semiotic interactions that take place beneath the surface, “Thure von Uexküll describes the body as a living semiotic system engaged in *dialogue* with its environment and internally with itself.”<sup>33</sup> Thure von Uexküll discovered that conscious and meaningful communication between cells and bacteria, which are endowed with a rudimentary level of awareness and certain semiotic capabilities, is what undergirds the inner workings of the human body. Not only have scientists observed the presence of purposeful and strategic communication in many different animal and plant species, but modern science has also proven that sign-systems form the basis of all six biological kingdoms.<sup>34</sup>

Morin references endosemiotic research conducted by specialists from several different fields throughout *Method*. Based upon what modern science has uncovered about “the miserable bacteria in our intestines,” the philosopher compels other scholars to think harder about communication.<sup>35</sup> Explaining that an infinite number of complex semiotic systems exist both outside of and within the human body, Morin declares, “Don’t forget that our body is first of all a republic of thirty billion cells.”<sup>36</sup> In this somewhat unsettling passage, the philosopher encourages us to take a closer look inside of the human host. Although they run counter to a substantial body of empirical research, anthropocentric models of communication continue to reign supreme in Western society. The scientific fact that even unicellular organisms make informed decisions predicated upon the information that they send, receive, interpret, and store supports the biosemiotic view that “‘mind’ and ‘ideas’ are not properties of humans alone, but are immanent in all living things.”<sup>37</sup> In this respect, Morin argues that studies related to the semiotic abilities of the bacteria that live within us should be of great interest to both semioticians and linguists.

Building upon recent scientific hypotheses concerning the complexity of communication that occurs within and outside of all species, Morin issues even bolder philosophical and linguistic claims. In particular, evidence linked to other-than-human semiosis has convinced him that every cosmic entity is a sentient being that must be considered a self-regulating subject in its own right. This deep conviction is inextricably connected to the biosemiotic concept of an *Umwelt*. On the first page of the second volume of *Method*, Morin affirms that it is impossible to understand the relevance of the signs emitted by any organism without reflecting upon the “*Umwelt*” in which they are produced.<sup>38</sup> First of all, it should be noted that Biosemioticians starting with Jakob von Uexküll have (re-)appropriated the term *Umwelt*. Summarizing the biosemiotic theory of an *Umwelt*, Dusan Galik elucidates, “Contrary to the contemporary meaning of “Umwelt,” which means [sic] organism’s external environment. Uexküll’s “Umwelt” meant the inner world of [sic] organism, the fact that every living organism creates its own world, its own reflection of the surrounding environment and acts in this environment

<sup>29</sup> (Wheeler 2011b, p. 177).

<sup>30</sup> (Roque 2011, p. 101).

<sup>31</sup> (Petrilli and Ponzio 2013a, p. 391).

<sup>32</sup> (Petrilli and Ponzio 2013b, p. 98).

<sup>33</sup> (Ibid., p. 102).

<sup>34</sup> In scientific circles, it is highly contested whether there are five or six kingdoms. For instance, see (Cavalier-Smith 2004).

<sup>35</sup> (Morin 1980, p. 169).

<sup>36</sup> (Ibid., p. 314).

<sup>37</sup> (Wheeler 2011a, p. 272).

<sup>38</sup> (Morin 1980, p. 17).

according to this reflection. Living organisms are not passive objects of the operation of natural laws, but active subjects.<sup>39</sup> Offering a similar operational definition as Galik, Marcello Barbieri explains that von Uexküll “adopted the world *Umwelt* (coined by a poet in 1800) to indicate the subjective inner world of an organism.”<sup>40</sup> Given that he directly attributes the idea of an *Umwelt* to von Uexküll, it is apparent that Morin employs this terminology in the biosemiotic sense in *Method*.<sup>41</sup> Additionally, in chapter five of the aforementioned second installment of *Method* in which he most clearly highlights his biosemiotic approach to understanding communication, Morin beckons linguists in search of a global, ecocentric vision of human and other-than-human semiosis to “go lose themselves in the hodgepodge of inter-feedback loops of the social and natural *Umwelt*.”<sup>42</sup>

As Galik’s above explanation of an *Umwelt* underscores, this evidentiary-based concept has far-reaching philosophical and linguistic implications. If all entities are capable of thought, conceiving their own mental representations of the world, and transmitting information through semiotic channels, we “need to make room for autonomous subjects throughout the natural world.”<sup>43</sup> In short, the “Morinian idea of the subject” opens the door to universal subjecthood.<sup>44</sup> As defenders of evolutionary paradigms for probing the origins of human language attest, the unfounded notion that only *Homo sapiens* can communicate in complex ways that surpass mechanistic responses to environmental stimuli is the “last bastion” of human exceptionalism.<sup>45</sup> The theory of an *Umwelt* completely shatters this lingering delusion of human ontological grandeur and implores us to reexamine our preconceived ideas about semiosis.

From a linguistic standpoint, Morin’s *Method* is a rewriting of the Cartesian perspective of the subject and its pervasive influence over how we have traditionally framed other-than-human communication. “Choosing Descartes as a starting point,” Morin attempts to expand our myopic frame of reference regarding semiosis.<sup>46</sup> As Laurent Dobuzinskis reveals, Morin’s neologism *computo* “extends the meaning of the Cartesian cogito far beyond human consciousness.”<sup>47</sup> In the fourth section of the chapter “The Heart of the Matter” from the second volume of *Method* entitled “The computo,” the philosopher tries to disprove “Cartesian presuppositions” about non-human communication that he insists are grounded in chimerical wishful thinking rather than rigorous philosophical inquiry.<sup>48</sup> Problematizing the Cartesian theory of *cogito*, Morin affirms, “The moment of *cogito* was decisive in Western thought [ . . . ] From now on, the Cartesian *cogito* would confer this supreme sovereignty upon the consciousness of *Homo sapiens* and it would serve as the foundation and crowning achievement of the myth of modern humanism.”<sup>49</sup> Alluding to the biosemiotic concept of an *Umwelt*, Morin uses his neologism *computo* to rework the Cartesian *cogito* entirely. Rejecting Descartes’s assertion that *cogito* is limited to *Homo sapiens*, Morin maintains, “We can go even further and consider that all forms of living organization contain a cognitive dimension.”<sup>50</sup> Explicitly stating that his theory of *computo* is an attempt to correct certain anthropocentric assumptions about the essence of life and communication that lie at the heart of Cartesian thought, Morin argues, “The Cartesian *cogito* placed the subject outside of all biological rootedness. We can now bring about this rootedness [ . . . ] Through *computo*, we can give back to even the humblest life form that which was amputated.”<sup>51</sup> By (re)-anchoring the concept

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<sup>39</sup> (Galik 2013, p. 860).

<sup>40</sup> (Barbieri 2007, p. 104).

<sup>41</sup> (Morin 1980, p. 17).

<sup>42</sup> (Morin 1980, p. 82).

<sup>43</sup> (Dobuzinskis 2004, p. 438).

<sup>44</sup> (Manghi 2013, p. 77).

<sup>45</sup> (Christiansen and Chater 2015, p. 1182).

<sup>46</sup> (Manghi 2013, p. 61).

<sup>47</sup> (Dobuzinskis 2004, p. 437).

<sup>48</sup> (Whiteside 2004, p. 359).

<sup>49</sup> (Morin 1980, pp. 181–82).

<sup>50</sup> (Ibid., p. 184).

<sup>51</sup> (Ibid., p. 189).

of a subject into the fundamental material realities that govern the existence of every creature on this biosphere, Morin aspires to achieve a better understanding of semiosis that is less biased and fraught with error. In place of the Cartesian *cogito* that has misled many researchers into ignoring the complexity of other-than-human communication, Morin advocates in favor of a “biological” conception of subjecthood that forces us to rethink standard communicative paradigms.<sup>52</sup>

#### 4. Conception of a Biosemiotic Framework for Understanding the Complexity of Communication within the Human *Umwelt*

Although the philosopher’s theory of *computo* illustrates that semiosis is quite literally everywhere, he recognizes that *Homo sapiens* have a heightened predilection for the exchange of signs. In simple terms, all organisms engage in semiosis, but semiotic capabilities vary greatly from one species to another. Embracing a biosemiotic position and articulating what distinguishes a human subject from an other-than-human subject, Morin posits, “Certainly, no other living subject besides man can express through language the attribute of subjecthood. But every subject expresses this in its being, its organization, its computation,<sup>53</sup> its behavior.”<sup>54</sup> While simultaneously reaffirming his philosophical premise of universal subjecthood, the philosopher admits that human semiotic vectors are the most elaborate of all. The interrelated biosemiotic concepts of an *Umwelt* and a “primary modeling device” help us to understand Morin’s nuanced stance regarding human communication.

In her article “Postscript on Biosemiotics: Reading Beyond Words-And Ecocriticism,” Wendy Wheeler explains that semiotic complexity correlates to the type of *Umwelt* in which a given organism dwells. Comparing the expansive human *Umwelt* to that of a tick, Wheeler asserts, “living things exist in species *Umwelten* which are signifying environments composed of the signs which are meaningful in the survival of any species. Environments [ . . . ] are always semiotic environments. The *Umwelt* of the tick is a very limited semiotic environment: the *Umwelt* of the human is correspondingly very extensive.”<sup>55</sup> Researchers such as Todd Freeberg, Kimberly Pollard, Daniel Blumstein, Stephanie King, Vincent Janik, and Jessica Flack<sup>56</sup> who continue to refine the “social complexity hypothesis” propose a strikingly similar theory for comprehending our biological propensity for communication as biosemioticians. Arguing that social complexity is the driving factor behind semiotic ability, Kimberly Pollard and Daniel Blumstein reveal, “Complexity in communication can be defined analogously to complexity in sociality.”<sup>57</sup> Pollard and Blumstein reiterate, “Attributes of social complexity may thus generate a need for animals to exhibit different types of communicative complexity.”<sup>58</sup> Given that *Homo sapiens* reside in the most wide-ranging *Umwelt* of all that is exponentially growing because of the proliferation of modern technology, it is to be expected that our species has developed the most intricate semiotic channels in which to exchange information.<sup>59</sup>

Morin’s previously mentioned statement about the singularity of human language on this biosphere is once again a reflection of a larger biosemiotic ethos. According to biosemioticians, “all living beings are endowed with a capacity for *modelling*, *communication*, and *dialogism* with the difference that the ‘primary modelling device,’ or ‘language,’ is exclusive to human beings [ . . . ]

<sup>52</sup> (Ibid., p. 283).

<sup>53</sup> This word choice directly relates to Morin’s notion of “*computo*”.

<sup>54</sup> (Ibid., p. 170).

<sup>55</sup> (Wheeler 2008, pp. 140–41).

<sup>56</sup> (Freeberg 2006; Pollard and Blumstein 2012; King and Janik 2013; Flack 2013).

<sup>57</sup> (Pollard and Blumstein 2012, p. 1869).

<sup>58</sup> (Ibid., p. 1871).

<sup>59</sup> Although the human primary modelling device of language is the most complex form of semiosis, the research of the marine biologist Vincent Janik mentioned above illustrates that the sign systems of dolphins are extremely elaborate as well. Similar to Janik, the scientists Susan Parks, Dana Cusano, Alison Stimpert, Mason Weinrich, Ari Friedlaender, and David Wiley (Parks et al. 2014) have observed that humpback whales make informed decisions based upon the plethora of information that they regularly exchange through semiotic codes.

Sebeok described language as a human primary modelling device.<sup>60</sup> Every species is endowed with a model that ‘produces’ its own world. ‘Language’ is the name he chose for the human model.<sup>61</sup> In *Method*, Morin confirms the biosemiotic view that language is indeed unique to human beings. Due to our fine-tuned semiotic faculties linked to the complexity of the societies in which we live, we have conceived the most elaborate primary modeling device for creating, emitting, receiving, and stockpiling signs in the universe. In this sense, Timo Maran declares, “Although all living beings are capable of participating in semiotic processes and using signs, there is something uniquely specific to human’s semiotic competence as compared to that of other living organisms.”<sup>62</sup> Realizing that the most astounding primary modeling device of all is limited to *Homo sapiens* that he describes as a “superprimate” and a “supermammal” for this reason, Morin avoids falling prey to hyperbolic discourse about other-than-human communication.<sup>63</sup>

Biosemiotic theory also sheds light on Morin’s reflections about the nature of human identity in *Homeland Earth*. Through the primary modeling device of language, we have created subjective representations of the world that seem to know no bounds. There is nothing outside of the operational logic of our pervasive semiotic codes or our “personal semiotic space.”<sup>64</sup> Underscoring that we are the only entities that are able to inhabit a symbolic universe purely of our own design, Mohammad Nehal and Mohammad Afzal note, “While animal communication is solely based on icons and indexes, human language is based on symbols” that “are arbitrary and increase distance from reality.”<sup>65</sup> In reference to human symbolic realms that derive their force from our primary modelling device of language, Morin proclaims, “*Homo* the super-living has created new spheres of life [ . . . ] forms that depend on language, concepts, and ideas, and that feed the mind and consciousness.”<sup>66</sup> The philosopher concurs with mainstream biosemioticians who affirm that we are the only creatures that are capable of almost entirely dwelling within the ever-expanding confines of our symbolic worlds constructed through language.

## 5. Reflections Concerning the Environmental Repercussions of the Ubiquitous Realm of Human Semiosis

Reflecting upon the environmental repercussions of the ubiquitous layer of human semiosis that has transformed much of the biosphere at the dawning of the Anthropocene epoch, Morin offers the following grim assessment of the anthropogenic crisis: “The biocenose has been from this point on destroyed, and there only remains a single species between the metallic paws of the technosphere.”<sup>67</sup> The philosopher describes a situation in which the human *Umwelt* has been expanded “by the use of technology” to such an alarming extent that it has effaced everything in its path.<sup>68</sup> As Susan Petrilli and Augusto Ponzio explain, “The human being not only produces his or her own world, but can also endanger it, and even destroy it to the point of causing the extinction of all other life forms on Earth.”<sup>69</sup> The realization that the human semiosphere-technosphere adversely impacts all other organisms that call this planet home pushes Morin “in the direction of semioethics” in *Method*.<sup>70</sup> In chapter four of *Method* dedicated to “general ecology,” the philosopher contends, “Society has to go back to nature whereas nature has to return to society.”<sup>71</sup> Morin is not promoting a Rousseau-esque return to nature

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<sup>60</sup> All of these words are italicized in the original text.

<sup>61</sup> (Petrilli and Ponzio 2013a, p. 107).

<sup>62</sup> (Maran 2014, p. 146).

<sup>63</sup> (Maran 2014, p. 39).

<sup>64</sup> (Kull 2007, p. 172).

<sup>65</sup> (Nehal and Afzal 2013, pp. 681–82).

<sup>66</sup> (Morin 1999, p. 40).

<sup>67</sup> (Morin 1980, p. 73).

<sup>68</sup> (Wheeler 2008, p. 145).

<sup>69</sup> (Petrilli and Ponzio 2013a, p. 93).

<sup>70</sup> (Ibid., p. 93).

<sup>71</sup> (Morin 1980, p. 77).

and complete abandonment of modernity, but rather he is referring to the deleterious effects of cosmic amnesia that are rampant in Western civilization. The ever-present nature of our symbolic forms of communication, which concretize the modern lifestyle, has created a deep schism between *Homo sapiens* and the remainder of the biosphere, thereby resulting in a fractured sense of ecological awareness. Given that “human consciousness stands alone” in our alienated semiosphere-technosphere, we have forgotten that our continued existence is contingent upon the overall health of the ecosphere that we are continually ravaging with our literal and semiotic pollution.<sup>72</sup>

If we are to survive the anthropogenic crisis of our own creation, the philosopher maintains that we must embrace a different way of being and living in the world. As Morin underscores, “It’s not by chance if ecological consciousness can often assume an existential form, inciting us to drink, get around, live, and work differently.”<sup>73</sup> Due to the gravity of our current predicament, the philosopher concludes that it is time to “change paths, to change how we live.”<sup>74</sup> Providing concrete examples related to how human semiosis has altered the migratory patterns of numerous species that play an important role in the biotic community of life, Morin beckons the reader to contemplate how omnipresent human communication interferes with the sign-systems of other beings.<sup>75</sup> The philosopher elucidates that “matter semiotized by humans contributes to the degradation of the habitats of many endangered species, which are not able to perceive and interpret human-altered environments adequately.”<sup>76</sup> Highlighting that human semiosis has become a “serious environmental problem,”<sup>77</sup> Morin muses, “The technosphere extends to human life itself and throughout the natural world [ . . . ] Technocratic programs, based upon isolated objectives that are profitable in the short term, break up regulatory loops of feedback, tear and degrade forms of eco-organization, sometimes resulting in death.”<sup>78</sup> In a profoundly altered landscape dominated by human semiosis and technology, Morin argues that it is becoming increasingly difficult for other organisms to decode the natural signs upon which their continued existence depends. Moreover, the philosopher asserts that other species now have a harder time conceiving, transmitting, receiving, and interpreting codes because of the deafening sounds of human activity that impede their ability to engage in meaningful semiosis.

Articulating his deep-seated concerns about this disconcerting loss in semiotic diversity, Morin paints an apocalyptic portrait of a total semiosphere-technosphere in which the sounds of pollinators like bees have vanished from the face of the earth entirely.<sup>79</sup> As Santa de Siena notes, the philosopher expresses his disquieting anxiety concerning “the disturbance of the seasonal cycles, the climatic cycles, and the biological cycles” of creatures like bees that are paramount to the survival of humanity.<sup>80</sup> Given that farmers in China have already been forced to pollinate crops by hand due to the disappearance of bees and butterflies in several regions of the country, the harrowing scenario envisioned by Morin is frighteningly realistic.<sup>81</sup> Morin’s fears about dwindling bee populations around the world illustrate the importance of preserving other-than-human types of semiosis in a biosphere in which everything is connected. In this regard, many contemporary biologists and biosemioticians such as Almo Farina, Nadia Pieretti, Rachele Malavasi, and Mark Reybrouck<sup>82</sup> discuss how a heavy human footprint has compromised the integrity of the “soundscape.”<sup>83</sup> Taking advantage of a “new metric” called the Acoustic Complexity Index (ACI) for measuring the ecological wellbeing of a

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<sup>72</sup> (Morin 1999, p. 45).

<sup>73</sup> (Morin 1980, p. 93).

<sup>74</sup> (Ibid., p. 92).

<sup>75</sup> (Ibid., pp. 73–74).

<sup>76</sup> (Maran 2014, p. 143).

<sup>77</sup> (Ibid., p. 154).

<sup>78</sup> (Morin 1980, p. 73).

<sup>79</sup> (Ibid., p. 82).

<sup>80</sup> (De Siena 2005, p. 429).

<sup>81</sup> (Williams 2016).

<sup>82</sup> (Farina et al. 2014; Reybrouck 2015).

<sup>83</sup> (Reybrouck 2015, p. 2).

soundscape, Farina, Pieretti, and Malavasi have discovered that “acoustic communication can be degraded by noisy pollution which reduces communicative efficiency and masks some biological signals”<sup>84</sup> Demonstrating that the diversity of other-than-human semiosis that transpires in a given soundscape truly matters, Farina, Pieretti, and Malavasi reveal, “The conservation of the quality of soundscapes should be both an important target to aim for in future strategies and part of an umbrella action to preserve the environmental processes that are relevant for both animals and humans alike.”<sup>85</sup> In this vein, Morin suggests that anthropocentric linguistic paradigms epitomized by their “willingness to reduce and mutilate, to refuse complexity, can cost lives.”<sup>86</sup> For Morin, this recognition of the complexity of other-than-human sign-systems is a debate that transcends purely linguistic considerations. The philosopher affirms that the human semiosphere-technosphere desperately needs to evolve in order to protect all of the delicate semiotic threads into which the human saga has been woven.

## 6. Conclusions

In conclusion, Edgar Morin’s “complex thought” represents a preliminary blueprint for rethinking the essence of human and other-than-human communication in the Anthropocene epoch. Despite the inherent limitations of his transdisciplinary approach to understanding how signs are created, emitted, received, interpreted, and stored, Morin’s philosophy is more important than ever in a biosphere that is teetering on the edge of oblivion. The philosopher illustrates that the first step to (re-)establishing a healthier relationship with the rest of the cosmos is to reject bad anthropocentric ideas that have created a sharp ontological distinction between human and non-human entities. From both a philosophical and linguistic perspective, Morin insists that one of the most detrimental forms of outmoded Homocentric thinking that must be challenged at all costs is the notion that *Homo sapiens* are the only creatures that are capable of engaging in meaningful semiosis. The presence of billions of other autonomous subjects who incessantly exchange information in purposeful and strategic ways encourages us to reconsider our preconceived beliefs about communication that are grounded in ideology as opposed to empirical findings. According to Morin and other biosemioticians, a crucial part of this reexamination is to realize when the ubiquitous realm of human semiosis encroaches upon the sanctity of other-than-human sign-systems to the point of jeopardizing our own existence. The biosemiotic discovery that every species possesses the capability of communicating with each other and conceiving mental models for representing the world is also a timely reminder about the fragile threads that sustain the universal tapestry of life.

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<sup>84</sup> (Farina et al. 2014, pp. 241, 252).

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<sup>86</sup> (Mortimer 2011, p. 79).

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