

Chapter 4

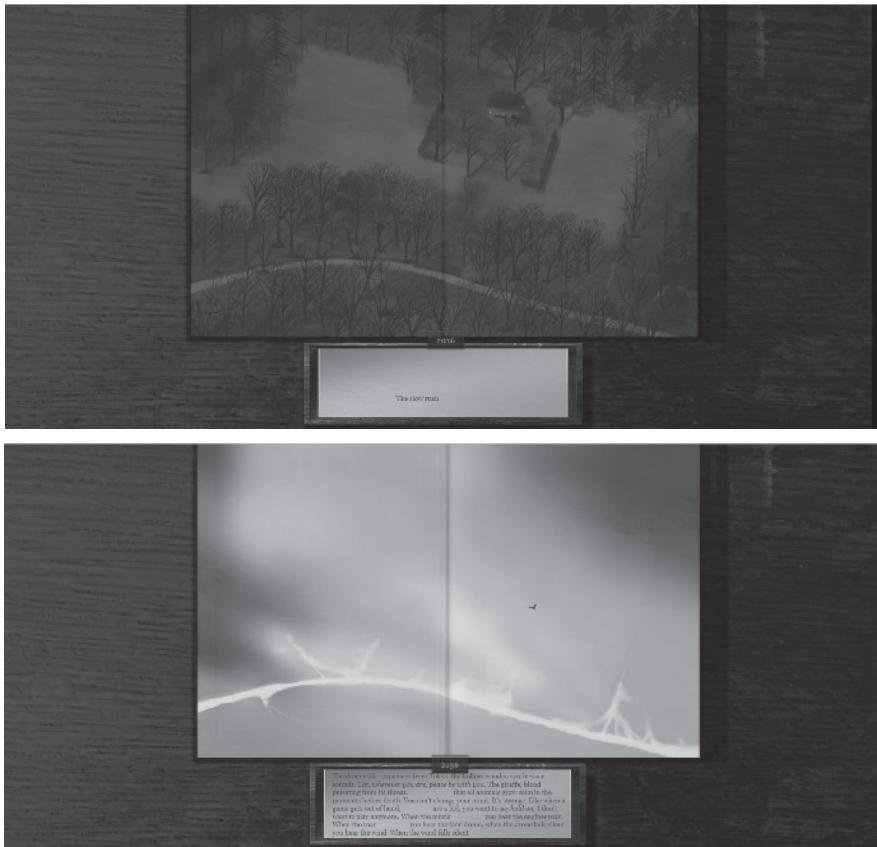
Field Recordings from the Future: Astroecological Thinking in Johannes Heldén's *Astroecology* (2016)

A desk with two screens, one is large, the other small. The large one shows an image of a forest landscape with a lonely house and garden. A fence encloses the garden from the forest that surrounds it. A small road passes through the woods. The year is 2016. The image alternates between day and night. A black bird flies over the landscape in a repetitive pattern. Random clicks with the mouse create small changes. Words and text fragments perform on the screen and become poems. Glimpses of nature photography appear while encyclopedic texts about extinct plants and animals open upon command. The world is slowly advancing at ten-year intervals towards a future, a predictable and final end at which time the world as we know it, or knew it, will have become non-retrievable. This world appears lifeless in a static image of planetary nebula, cold, full of waste and unfriendly. Here, we encounter an imagined end of history, civilization and nature. The impact from humans and evolution has transformed the landscape into a post-anthropocentric world. The sound of wind and gloomy music with dark, long tones and a slow rhythm run continuously in the background. It is as if these are the sounds of evolution; as if we are being spoken to from a remote and imagined future; as if what we witness on the screen are "field recordings from the future."¹

Technogenesis and the idea that artificial intelligence has replaced human subjects, which I discussed in the previous chapter, are further explored in Johannes Heldén's *Astroecology* (2016a). *Astroecology* is a work of science fiction in which a specific landscape is lifted into a spaceship. Here, one or several subjects observe how the landscape evolves from 2016 till its final collapse in 2156. The work reflects poetically on nature, technology and human cognition in the Anthropocene; it serves as a real and fictitious archive of the past and of a future in which artificial intelligence has replaced human beings as observers, archivists, storytellers and poets.

Like *Evolution*, *Astroecology* is a media-ecological work that traverses media platforms, genres, art forms and situations. It is materialized as digital poetry, as a print book, art installation and theatrical performance, which was staged at the Royal Dramatic Theater in Stockholm. Furthermore, the work is constantly expanding, since it is part of new media-ecological relations. Various parts of the work

¹ See @astroecology.



Figs. 5 and 6: Two screenshots from the digital part of Johannes Heldén's *Astroecology* (2016a). Figure 5 shows the opening scene, while figure 6 depicts the end of the work, with one of six poems below the image.

have been shown and read from a number of times. Moreover, new installations based on the work's subject matter have been produced which include both Heldén and Håkan Jonson's print work and installation *Encyclopedia* (2015) and Heldén's Instagram account @astroecology. In the latter, Heldén describes his ongoing artistic project as "field recordings from the future." *Astroecology* bears the mark of thematic and audio-visual aesthetics that we can recognize in many of Heldén's earlier works, such as *Entropy* (2010) and *New New Hampshire & Clouds* (2017). Still, *Astroecology* differs somewhat from Heldén's previous works: while earlier works like *Elect* (2008), *The Prime Directive* (2006), *Entropy* (2010) and *The Fabric* (2013) depict an unrecognizable future world from the beginning on, *Astroecology* begins in a

familiar world only to move into one that can only be characterized as dystopian, unfamiliar and unfriendly.

The transgression of media is, as I have argued in the previous chapter, the DNA of Heldén's poetic-artistic practice. Multimedia and composite expressions characterize individual works, as he combines words, music, graphics and photographs. For example, the print book *Astroecology* (2016b) contains photographs, drawings, poems, captions and footnotes with narrative, non-fiction and poetic texts. Likewise, the digital part of *Astroecology* is constituted by a dynamic image in the background that interacts with narrative texts, poems, photographs, encyclopedic texts and ambient music. All together, the interaction between genres and media creates performative events that present a possible future, a future scenario in which the world as we know it ends, that is, a world in which all known biological life seems to have been erased and the eco- or astroecological system has broken down.

In this chapter, I explore what *Astroecology* can tell us about the situation of poetry in the twenty-first century. In other words, I am interested in how poetry in the computational network environment contributes to knowledge about the Anthropocene and engages in the question of imagined futures. In this way, we find that poetry serves as an exploratory mode towards one or more horizon. I put the question of the Anthropocene and the notion of a future planet without human beings or other organisms at the center of my attention. Despite the fact that *Astroecology* is an intermedial and media-ecological work, I mainly concentrate on the digital part of the work, only intermittently drawing attention to the print book *Astroecology* when it is necessary for the sake of analysis and argumentation. I argue that Heldén's work is an attempt to develop poetry that contributes to the defining of the media-ecological environment. Therefore, *Astroecology* represents both a response to the Anthropocene as well as a way to think poetically and astroecologically about a future that is disconnected from human consciousness. Heldén makes visible the coexistence of nature as an ongoing evolutionary process and technological medializations as prefiguring the process of archiving and memorializing the past. *Astroecology* depicts the entropy of an imagined future in the Anthropocene. My claim is simply that *Astroecology* explores a particularly ecological way of thinking and presents a past, present and future within the framework of the Anthropocene, where evolution relentlessly moves towards an end that simultaneously implies the end of human beings and other organisms.

Reading *Astroecology*

Before going further into the work, it is important for the sake of the analysis to clarify the premises, partly set by the digital medium, for reading *Astroecology*. The work calls upon a different mode of reading than much other poetry does, including poetry in digital media. Most noteworthy is the fact that the reader must click on the screen in order to proceed in the work. Without the reader's interaction, poems, photographs and encyclopedic texts simply do not appear. Likewise, it is up to the reader to either complete the appearances of each poem or move forward in the work before the respective poem is completed.

Aesthetic and semiotic elements do not become objects for the reader's sensations and analysis unless he or she makes sure they all appear. In other words, unless the reader calls these elements forward, either by accident or by intention, they will not become part of the text that is read and analyzed. Similarly, the evolution and development of the world of the work are conditional, since the reader needs to click on the figure of a jackdaw that is flying over the landscape on the screen. Hitting the figure of the bird with the mouse cursor, the world on the screen jumps ten years into the future. Here, two aspects are imperative for methodological reflections. One is that even though this activity imposes a chronological narrative to the work, it is still experienced and explored in multilinear and anachronic sequences. The graphic visualization of the world on the large screen is organized in a linear fashion, and there is no way for the reader to skip ahead a decade or rearrange the order of the appearance. Still, the order of the poetic phrases and the photographs appear randomly. This non-linear order of the phases and photographs are not in themselves significant for the interpretation; however, whether or not the reader brings forward all the photographs and all the poetic phrases are, of course, vital for the experience and interpretation of the complete work. This process is significant for the reading of the work. The reader can jump from one decade to another without activating any of the photographs or phrases, by engaging only some of these elements or by fully completing each stage. The latter means that readers make sure that they have seen all photographs, completed the poem and made it available as a whole, before they, as if playing a computer game, try to hit the figure of the bird moving restlessly and playfully over the screen and thereby proceeding to the next decade.

On the one hand, this activity demonstrates how the poem can be regarded as an event and how the reader needs to perform in order to develop the poem, materialize the photographs, if only for a second, and make the work proceed. The act of reading becomes a performance that is necessary for conducting the analysis. This combination of performance and analysis is relevant for interactive works in general. Still, in *Astroecology*, readers are put in a situation in which they more or

less search for the hidden photographs and poetic phrases at random. This interactive aspect of *Astroecology* might be associated with hypertext fictions like Michael Joyce's *afternoon, a story* (1989) or Megan Heyward's *Of Day, Of Night* (2002). Nonetheless, this mode of searching is close to a mode of playing, corresponding with what I have called elsewhere the “explorative mode of reading.” (Rustad 2009) This kind of reading implies that the reader either feels satisfied by the search itself, that is, in finding elements in the work or where the explorative mode is replaced by a mode of close reading, that is, where the reader finds pleasure in the meaning making process. In the reading of the work, this ergodic activity might take time and require persistence. In other words, there is an aspect of patience in both the close and deep reading of the work and in the explorative and performative aspect in which the “material” for close reading is brought to the screen, comprising the sensory world of the reader. It almost goes without saying that in analyzing *Astroecology*, one must repeat the above-mentioned action several times in order to be able to grasp how the work behaves, the significance of its behavior and the meaning of the combination of art forms and genres in the work.

“Landscape elevated”

Astroecology can be regarded as an experimental laboratory, or perhaps as a modern version of Noah's ark, where, according to one of the poems, the landscape and organisms are lifted into a spaceship. At one point, this action is observed on a monitor:

The landscape elevated and placed in the cargo hold of an unmanned spaceship. The vegetation spreads through the ventilation, forming forests, swamps, fields, a cloud (shadows). (#2036)²

The poem describes the elevation of a particular landscape that contains organisms removed from their natural habitats. Likewise, in other texts in the work, organic species are mentioned as candidates chosen for a non-identified experimental project. One text refers to the blue whale as “a candidate for uplift, along with jackdaw and bottlenose dolphin,” (#2026) while another says that the vascular plant (a fern) has been re-programmed: “Due to this mutation one subspecies was the first plant to be re-programmed in 2024.” (#2046)

In a dictionary section of the print book *Astroecology*, the term “uplift” is described: “In science fiction, uplift is the terraforming of a planet's biosphere, so as

² There is no pagination in the digital work. Hence, I refer to the sections by using the respective year in which the quotations appear.

to artificially nurture native and/or alien life-forms. It also implies the development or transformation of animals into intelligent, Type-I races using biological engineering or evolutionary intervention.” (2016b, up) The technical term “terra-forming” refers to a process, common in science fiction, where one reshapes a planet in order to make it inhabitable for humankind. In *Astroecology*, the object of terraforming appears to be the planet Earth and, more specifically, a landscape on the planet Earth. Therefore, the work might be regarded as a laboratory for exploring and responding to the Anthropocene, where the purpose is to try to preserve organisms and reshape the landscape in order to make it a friendly place for humans and non-humans, and to explore the future of the landscape and the planet to predict the outcome of evolution. In this respect, *Astroecology* stages a process towards an imagined future in the Anthropocene. This future and its impact on human beings are reflected in such contemporary book titles as *The Sixth Extinction: An Unnatural History* (Kolberg 2014), *Learning to Die in the Anthropocene* (Scranton 2015) and *The Uninhabitable Earth* (Wallace-Wells 2019).

In the English version of *Astroecology*, the poem quoted above lacks a line that is included in the digital Swedish-language version. In Swedish, the poem ends with the line “Här medvetandets slut, mellanrummens kollaps eller årstidernas logik.” This line is also reprinted in the book version of *Astroecology*, where it reads: “Here the end of consciousness, the collapse of spaces, or the logic of the seasons.” (2016b, n.p.) The word “here” is a spatial and a temporal deixis. It points to both the landscape that is present in the visual representation on the monitor and a certain moment in time. It might be a subject’s evaluation of the project to elevate the landscape, an elevation that at some point in the experiment leads to a collapse in the ecosystem, and, subsequently, it might refer to the moment when human and technological interventions in the process of evolution got out of hand.

The house and the cultivated garden that is centered on one of the monitors at the beginning of the work slowly fade away. Moreover, the once civilized and domestic location is gradually reclaimed by nature. Bit by bit, the house and garden disappear from sight and are replaced by trees. However, this replacement is also only temporary, since evolution never rests and makes no distinctions. Progressively, the vegetation likewise fades away and leaves us with a wasteland. From 2016 (Fig. 5) till the end of the work in 2156 (Fig. 6), we witness how the location is transformed from what seems to be a familiar, friendly and domesticated place into a non-biological and non-recognizable time-space.

Images of the house with the garden, verbal descriptions of events, animals, flowers and plants, indeed also the ambient music, are what we could call, using Heldén’s motto, field-recordings from a future. These are either documentations of the past or archives from a future yet to come. The house serves both as symbol and indexical sign. It appears at once as what it is, a house, a home, and as a

symbolic representation of the planet as the home for all organic life. The framed image can be related to the origin of the word “eco-” in the Greek “*oikos*,” meaning house and community. While Aristotle, for instance, uses the term “*oikos*” to refer to those living in a house and within a particular hierarchical structure (see Aristotle 1986, 14), *Astroecology* presents this local dimension of “eco-” as a metonymic trope for a larger egalitarian ecology – “*oikos*” as planetary and “astro-ary.”

Evolution is presented as it is. It is a force that cannot be controlled by humans or technology. Both civilization and cultivated nature disappear in a process that, from a human perspective, may appear to be dystopic but that, from a non-anthropocentric perspective, is merely “natural.” This process is presented through animation, sound, encyclopedic texts and poems. Thematically, this multifaceted presentation is obviously not unique in contemporary culture. Rather, it can be understood as “a cultural dominant” (Jameson 1991) and as part of a particular trend in contemporary literature (see i.e. Vermeulen 2020) and poetry (see i.e. Larsen 2018, 55–126). A number of contemporary literary works in digital media explore the relationship between human beings and their environment within an apocalyptic framework. We need only think of a work like *Toxi City: A Climate Change Narrative* (2016), by Roderick Coover and Scott Rettberg or more poetic and philosophical-explorative works such as J.R. Carpenter’s *The Gathering Cloud* (2017) and *This is a Picture of Wind* (2017b, 2017c, 2020). Similar to Coover, Rettberg and Carpenter, Heldén adds the discourse of technology to this exploration and cultural dominant, offering a special way of presenting evolution and the imagined futures it brings with it. More to the point, we might say that the digital part of *Astroecology*, through the experimental framework and the media-ecological work as such, makes poetry a space and an art form for imagining a future through eco- and astroecological thought.

Astroecological thinking and imagination

Astroecology is a response to the Anthropocene, in which the fate of humankind, organisms and the world as we know it has already been decided. While the ecocritical perspective is only vaguely articulated in the digital part of *Astroecology*, the printed book makes this perspective more explicit. Here, we can read about humans’ over-consumption of natural resources and the development of artificial intelligence. The work has previously been read in the framework of ecocriticism. Gitte Mose claims that *Astroecology* represents the missing link between the novel and digital literature (Mose 2020). It has been approached as an artwork that presents evolution as a natural, non-anthropocentric force of which only goal

seems to be development, not conservation (Rustad 2020). Technological development is seen here as an acceleration of destructive evolution (Roberg 2019).

According to Alexa Weik von Mossner, ecocritical narratives belong to a genre that includes “any type of narrative in any media that foregrounds ecological issues and human-nature relationships, often but not always with the openly stated intention of bringing about social change.” (Mossner 2017, 3) Heldén expands on this open-ended definition offered by Mossner. Heldén’s poetic work combines narrative and poetic modes, including poems, photographs, visual narratives, encyclopedic texts and ambient music, and exists simultaneously and in egalitarian fashion on different media platforms. This approach, offered by Heldén, seizes the environmental changes that have and may come, changes that human progress and technological inventions have forced upon nature.

The title, *Astroecology*, composed of the cosmological term “astro-” and the biological term “ecology,” denotes the study of the interaction between organisms and their local, global, planetary and astrological environment, i.e. an environment that also includes the universe. Sofia Roberg further comments on the title of the work, writing that it refers to “the interaction between living organisms and space environment, as well as the scientific study of other planets and celestial bodies.” (Roberg 2019, 6) With the prefix “astro-”, the title points to a spatial expansion of a conventional conception of ecology. It is a version of an ecology that includes planets other than Earth. Stars, asteroids and comets are also taken into account in order to reflect on possible futures. With such an expansion, the term reflects a time and place that transcends human time and the Earth as the planet for humans and human-known species. In this respect, the title reflects a kind of transcendental thinking, a thinking that transcends both an anthropocentric perspective and earthbound ecology.

The work encourages reflections and explorations that exceed the future of humankind and the planet earth. Such a transcendental ecology resonates with Timothy Morton’s ecological thinking. In *The Ecological Thought* (2010), Morton claims that “in the West, we think of ecology as earthbound. Not only earthbound: we want ecology to be about location, location, location.” (Morton 2010, 27) According to Morton, location reflects an anthropocentric worldview and represents a narrow interest in the domestic sphere. Such thinking is limited to the “here and now, not the there and then.” (Morton 2010, 27) Morton’s proposal is, therefore, a form of ecological thinking oriented towards “dislocation, dislocation, dislocation.” (Morton 2010, 28) In other words, Morton believes that we have to change our engagement with the question of ecology and the climate situation, moving beyond our own situation and time. Consequently, Morton calls for an ecological thinking that points towards something greater than us, where humans are neither the center – the goal, the meaning – nor constitute the center of attention for reflections on politics

and science. Likewise, the term “astroecology” transgresses knowledge of the planet’s ecosystems in a human world and human scientific thinking. Astroecology is a concept that encourages thinking that goes beyond thinking – to think the unthinkable, to use Morton’s words. This kind of thinking would include another of Morton’s widely used terms, “mesh”, i.e. the idea that all organisms and objects are completely interdependent and interconnected in time-space. Mesh can be described as a non-hierarchical network, a rhizome, organized without center or periphery as a principle of structure and without beginning or end. This structure supports the unsentimental and subversive mode of Morton’s “dark ecology”. Closely linked to such thinking, in which the understanding of humankind and nature framed through subject-object relations is brought to an end, is Morton’s concept of “strange strangers.” This is the idea that we cannot, and should not, try to overcome that which is strange to us. According to Morton, we should instead cultivate the strangeness of the other, avoid controlling it and thus counteract inherited ideas of hierarchies with regard to humanity’s relationship to its environment. According to Morton, this is the way to recognize the strangeness of the stranger.

In the development and presentation of an ecological thinking that is transcendental, Morton highlights, among other things, the role and value of experimental art and literature as forms capable of performing such thinking. In this context, Morton points out that the shape of the works and performances for an ecological thinking are just as important as the content of the thinking: “It’s not simply a matter of what you’re thinking about. It’s a matter of how you think.” (Morton 2010, 4) Furthermore, he emphasizes how art can create a radical openness to an ecological thinking: “Along with the ecological crisis goes an equally powerful and urgent opening up of our view of who we are and where we are. What, therefore, is environmental art? If what we inadequately call the environment entails a radical openness, how does this appear in art forms?” (Morton 2010, 10) For instance, we can imagine, as is the case with Heldén’s artworks, that poetry and the arts reflect an openness to alternative ways of thinking by moving across institutional frameworks and media borders, by combining art forms and genres and by making use of the affordances of digital media, including their programmability and network organization. Whether this is a radical openness in the computational network environment can, of course, be questioned, but at least it is fair to say that artworks like Heldén’s *Astroecology* reflect a way of thinking that converges with an ecological or, more precisely, astroecological thinking.

In what follows, I argue that Heldén presents evolution as a force that brings the history of the planet beyond the history of humankind and known organisms, beyond a local ecology towards an astroecology. There is, in fact, no subjective evaluation of or subjective feelings related to the processes and consequences of evolution. Actually, human and non-human subjectivity are questioned. Although the

title of the work refers to an ecology that transcends planet Earth as a place, embracing an ecology of the universe, Heldén's multimedia works are limited to the planetary and take local and domestic spaces as their points of departure. This place is, as mentioned above, both concrete and metonymic. Nevertheless, *Astroecology* demonstrates a shift in thinking from a local ecology to a planetary and astroecological one. Astroecological thinking is reflected through the perspective of the local, the house, the domestic and the familiar. Heldén offers an image of how the world becomes uninhabitable and how species other than humans evolve – and this is a point I will have to return to – in a way that allows us once again to question the distinction between human and non-human animals. As I show, *Astroecology* involves an exploration not only of a possible future but also of a possible future relationship between the human and the non-human, the organic and the non-organic and the technological and natural. In the following, I examine how the different forms and modes of expression employed by Heldén (poems, images, pictures, animations and encyclopedic texts) create an image of an astroecological collapse and contribute to an astroecological thinking.

Poetry and the astroecological collapse

Astroecology contains six poems. They appear in a separate frame at the lower part of the screen. They emerge as events and have a prominent, performative role throughout the process. A post-catastrophic world is present from the beginning on and is presented in the first poem with elements of destruction, flooding and vegetation that overtakes the human world.

The illuminated trail, 8:30 pm. Low cloud cover, no stars, high levels of oxygen. The few intact lightbulbs dimmed by thousands of waterdrops. sections passing through, the swamp flooded – the water could be waist-deep in the next step. Over the course of several years the asparagus plot transforms. Covered by weed, turning into meadow, into brushwood, the beginnings of a forest. The slow rush of vegetation up towards the garage. So the clouds came closer to the ground. (#2016)

The poem adds voice, mood, sensation, intensity and new dimensions of time to the visual presentation that, at each step, runs in a loop to signify shifts between day and night. It is descriptive: the speaker's observation is situated in a present now and is marked, at turns, by quantifiable time ("8:30 p.m."), experienced time ("sections passing through") and narrative time ("[o]ver the course of several years"). This now is poetic; it is a poetic utterance filled with multiple time structures. The poem goes back in time in order to describe how the landscape, covered with fields of asparagus, has been transformed. Simultaneously, the poem directs its attention

towards a future. The rain, which in the present is “thousands of waterdrops,” will become an imagined and possible future: “could be waist-deep.” The modal verb “could” here expresses a possibility, inscribing an uncertainty into the scientific world. Just like experienced time, this possible future-effect is measured and presented as an embodied experience. Similarly, the transformation of the asparagus plot appears as if it is an observation made by a human being. Moreover, this transformation seems to move from the poetic now, specified as “8:30 p.m.”, into an unknown future, “several years.” The sentence “the beginnings of a forest” continues in this reflective mode, anticipating what is to come.

In the last sentence of the first poem, the phrase “the clouds came” reflects a shift from present to past tense. This shift represents a change in perspective from a prophetic point of view, where a speaker imagines a future, to one in which the speaker is rendered a witness to past events. Further, the sentence “[s]o the clouds came closer to the ground” introduces an element of horror that underlines the dystopian dimension and atmosphere that are present throughout the work. Here, the coordinating conjunction “so” is crucial. This conjunction brings together the two sentences in question, but it also functions as a spatial coordinator since it connects “vegetation” to “clouds” or, in other words, earth to sky. The conjunction “so” brings earth and sky physically closer to one another. This action creates a sensation of claustrophobia and indicates the urgency of the situation. Additionally, the melding of earth and sky initiates a transformation of the poetic now, a transformation that was predicted in the first line with “low cloud cover” and “no stars”. These phrases correspond with the transformations that are presented in the graphic representation of the world from 2016 to 2026, only that in the poem, the changes are sudden and dramatic because they appear in a now, that is, in the moment of the poetic utterance and not over the course of a decade.

The poems are significant for experiencing and understanding both the astroecological evolution and collapse that take place. The poems fill the graphic representations that are organized in intervals of ten years with emotions and events. Further, the poems reinforce the representation of a world in which never-ending changes have already happened and continue to happen. As the second poem tells us: “The vegetation spread through the ventilation, forming forests, swamps, fields, a cloud (shadows).”

As mentioned earlier, the local and quotidian levels function as visual metonymies for astroecological thinking. The house and the surrounding vegetation slowly disappear. In 2056 (Fig. 7), the house has nearly become invisible while the forest that once appeared dense, strong and vigorous, is now dying, as if it had become diseased.

Evolutionary forces have transformed the *oikos*, the home, into a visual trace, an indexical sign of the past existence of human beings and other organisms. As



Fig. 7: A screenshot from *Astroecology*. In the year 2056, the house that once stood there is almost gone and so is the once strong and vigorous forest.

one of the poems recounts, the empty house – empty either because the former owners have left it, expelled by evolution or because humankind was not one of the “uplifted” species – has become a shelter for other animals. In the poem that appears for the year 2036, a speaker says: “The birds moved into the piano. When they land the strings vibrate from the draft, a silent tone fills the room, the light from the screens fainter and fainter.” (#2036) It is imperative to note the ambivalence in the poem’s preferentiality here. The narrative of the birds’ action and the silent tone they make are important for the poem’s diegetic world, a world that corresponds with that depicted on the screen. The line “the light from the screens fainter and fainter,” nevertheless, could refer either to this same diegetic world where light from the house grows weaker and weaker as both evolution and reading progress or, alternatively, to the observatory space where the world is depicted on computer monitors.

The poem’s narrative mode draws attention to the physical changes in the world, while the poetic mode, which is typical for Heldén’s poetry, provides the poem with sound and tactility and helps to create a particular atmosphere. Rather than emphasizing narrative questions, such as who lived in the house, why they moved out or what happened to them, the poem is a pure description of the sounds the birds make on the piano. The “silent tone” that “fills the room” heightens the atmosphere that is created and represents both a shift from a past to present tense and from a narrative to poetic mode.

The poems are structured around the sensations mentioned above and make use of what can be regarded as classic topoi from dystopian literature and film, such as the image of soot from burnt-out stars and “smoke rising from the hollows”:

Before the weather turns. Ashes trapped in the raindrops bound to the world above the treetops. Trying to make brick from iron-rich clay from the river. Burning the formless blocks in the abandoned fox-burrow below the old hotbeds, rerouting water from the drain-pipes. The whole plot is undermined, smoke rising from the hollows. Later, the cat sits on the windowsill looking out purring quietly. Water dripping everywhere. Soot from burnt-out stars falling slowly to the ground. (#2076)

This poem demonstrates a form of time-space. It is temporally divided into a before and after. Past and future are thus brought together in the poetic now, which, along with the choice of motifs, makes the poem cohere. The soot in the last sentence is already introduced in the first line as “ashes” and reappears in the middle of the poem with the word “smoke” as vehicle. Similarly, water is a central motif that is established in the first line with “raindrops.” It is then repeated in the second line as “the river” and in the third and fifth lines as “water.” Furthermore, it is worth noting that the poem uses verbs to underline the way in which natural elements serve as containers. In fact, these should be read both literally and metaphorically. The concepts in question are presented with an inside and outside. In the first line, we read that ashes are *trapped* and that raindrops are *bound*. Both ashes and raindrops are stuck in other materials, as if there is another world above the landscape with vegetation that grows on the garage wall.

Temporal and spatial structures are central to the poem. Moreover, these two dimensions are intertwined. The preposition “above” tells us that the world of the poem is divided in two. The sky and the clouds belong to a different world than the one with vegetation. This world above is definitely physical, not metaphysical. “Above” simply means the world of clouds, as the first poem indicates. In this way, the structuring of the poem in terms of time and space is interesting because the preposition “above” also makes this world a container of the “before” and “after.” The space already includes elements that will later become signs of ecological and astroecological collapse. The “after,” described at the end of the poem, is already present in the “before” in the “world above.”

The poem refers to changes in weather conditions, and it is in itself a transformation from one time and world to another time and world. The former world includes pre-modern techniques, while, in the latter, the poem describes a scene with a domesticated cat sitting in a window watching ashes fall from the sky. The verbs that are used, “make”, “burning,” “rerouting” and “sits”, are significant for defining the before and after. While the first three of these verbs describe the kinds of everyday work necessary to survive, the cat simply sits, shockingly calm – “quietly,” in the words of the poem. This shift is particularly violent because the quotidian scene of the cat is combined with a depiction of the “end of the world”.

Potentially, both before and after include a wide time-span. The work that is conducted, is, according to the poem accomplished with pre-modern techniques, and the iron-rich clay that the subjects are burning, itself a technique that can be dated to 7000 BC, is formed through natural and evolutionary processes over millions of years. Likewise, the cat transcends the moment described. Similar to the non-identified speaker, the cat is a witness, existing outside of time. Perhaps the speaker sees the past shining in the eyes of the cat, a situation reminiscent of what the “you” does in Rainer Maria Rilke’s poem “Schwarze Katze” (1908):

Doch auf einmal kehrt sie, wie geweckt,
 ihr Gesicht und mitten in das deine:
 und da triffst du deinen Blick im geelen
 Amber ihrer runden Augensteine
 unerwartet wieder: eingeschlossen
 wie ein ausgestorbenes Insekt.³

In Rilke’s poem, the cat is an archive, a container that holds everything it has seen, so that a spectator can later see what it has seen. In the poetic moment, these visions become available to the one who sees, who, in this moment, finds herself placed outside of time. In Heldén’s poem, a subject collects and stores what has been seen in this elevated now. The poem is different in style and tenor from Rilke’s. Heldén’s is calmer, more homogeneous and without the epiphany that is significant for Rilke’s poem. Nevertheless, in both poems the cat serves as a mythical figure and as a historical witness. The cat functions as an external archive of memories of events that exceed the duration of the ordinary lifespan of an individual cat. There is no human “you” mirrored in the cat’s eyes. Rather, “later” denotes the post-catastrophic and, most likely, the post-anthropocentric world.

The figure of the cat appears in two other poems. In one of the poems, a cat’s presence is materialized as footprints on an image of a digital book: “An image spread online: across the pages of a richly illustrated, handwritten book from the 1300s, the paw prints of a cat in ink.” (#2116) The footprints are indexical signs that remind us of the cat’s long-lasting presence in the world of literature, from the fourteenth century’s book culture into the digital culture of the twenty-first century. This description imbues the cat and the poem with a mystical dimension. In the sixth and final poem, the speaker calls out to a cat: “The dream-like sequences from Tokyo, the

³ “Black Cat”: “As if awakened, she turns her face to yours; /and with a shock, you see yourself, tiny, / inside the golden amber of her eyeballs /suspended, like a prehistoric fly.” An English translation of the poem can be found here: <https://www.poets.org/poetsorg/poem/black-cat> (15 December 2022).

hollow wooden synthesizer sounds, *Cat, wherever you are, peace be with you.*” (#2136) The apostrophe in italics is a quote from the experimental art house film *Sans soleil* (1983) by Chris Marker, taken from a ceremony for a lost cat. It is a common belief that *Sans soleil* was inspired by T.S. Eliot’s long poem *Ash Wednesday* (1930), which expresses a hope for the salvation of humanity in a secularized society. Such a hope for humankind is not present in Heldén’s *Astroecology*. Nevertheless, the reference to *Sans soleil* is interesting because the movie can be understood as an exploration of the relationship between images and memories. In this respect, the poems in *Astroecology* can be read as field notes and dream sequences, complex images from a memory bank of subjects that have been witnessing the changes in dystopian landscapes over decades, towards a future that is given at the end. This aspect opens the question of who the speaker in these poems is, a question that I will address later in this chapter.

Both the end of the world and the final astroecological collapse are depicted as images of a ruined, cold and lifeless world. This moment of death is described with intensity in the sixth and final poem through the image of a dying giraffe and an ecological chain reaction:

The giraffe, blood pulsating from its throat. Someone said that all animals grow calm in the moment before death. You can’t change your mind. It’s strange. Like when a game gets out of hand, when you are a kid, you want to say hold on. I don’t want to play anymore. When the music falls silent you hear the engines roar. When the roar falls silent you hear the fans drone, when the drone falls silent you hear the wind. When the wind falls silent – (#2156)

Could it be that the cat, sitting on the windowsill and watching the world around it collapse, is calm because “all animals” – according to someone that the poem refers to – are calm “in the moment before death”? Here, the image of the giraffe and the blood that pulsates is grotesque. It is at once a concrete image of a giraffe in the moment before its death and an allegory of the silence that will occur in the moment before the cessation of all organic life. This poem includes a simile, a figure of speech that is rarely used by Heldén. This comparison is embedded in the “like”, strengthening the allegory in the poem because the human “you” is like a child who plays a game. The combination of allegory and simile, read within the framework of the Anthropocene, implicitly expresses the fact that humankind has treated its surroundings like how a child behaves in a game, as if human exploitation of natural resources was a game. The Anthropocene is a reflection of the irreversible changes that humanity has brought to the earth through limited ecological thinking and action. Therefore, the Anthropocene also signifies the arc of evolution, an arc caused by humans and technology, from which it is now too late to reverse or withdraw. As a human being, you cannot withdraw or say you do not want to be part of evolution, whatever its course and causes may be.

The allegory and simile, the meanings of which are depth-oriented, are replaced in the last three lines of the poem by a figure of heterophony. Here, the world appears with multiple sounds like a cacophony and, as each sound peels away, a frightening announcement of silence becomes louder. The wind, the last sound on earth, falls silent. It is the image and sound of the final death. When the wind no longer makes a sound, it is because it no longer meets resistance from geological or organic objects. Frictions and intensities are absent, because there are no longer differences in air pressure and temperature, the meteorological conditions for moving air, and because the earth has stopped turning around the sun and its own axes. The beginning of this collapse is also mentioned in the poem from the year 2096. Here, the absence of wind is caught in the image of unmoving clouds: "Above the horizon: the clouds unmoving". Taking into consideration the fact that wind is an astroecological phenomenon, the silence of wind might indicate not only an earth-bound collapse but also a collapse in the solar system, *sans soleil*, a world without the sun.

Evolution and time cease, along with the wind and all known life forms. At this point, the poem also ends, marked by a dash, which coincides with the visual representation of the world, depicted almost like a dash, at the end of the work. As a metapoetic element, the poem is silenced, the only way it could possibly end, in which the prolonged postponement of a union between sound and meaning, semantics and semiotics, dissolves.

Collective memories and archived knowledge

As I have argued already, *Astroecology* is science fiction poetry; it stages an imagined future. The poems combine past, present and future, condensing the nowness of the poems into a single moment. Further, the work also functions as an archive of the past. The poems are complex images from a memory bank, representing sensations and experiences associated with the effects of evolution on the landscape. The work also contains other sources of collective memories along with other types of memory technology. These technologies include photographs of landscapes and organisms and encyclopedic texts about species that have become extinct and therefore only exist as representations of collective memories.

Photographs of nature appear on the screen in short moments of time. They are made visible due to the reader's action and appear as if they are sense-memories, short and sudden glimpses of things previously seen. In short, they intensify the feeling of absence and the loss of past time and nature. These memories are neither place- nor time-specific, nor are they oriented towards the planetary, the national or

the local, as is the case with the graphic representation of the house in the woods. They are also not linked to a specific sense-subject, enhancing the possibility of reading them as collective memories of a world that has always already been in the process of disappearing.

Encyclopedic texts appear on the screen in the transition between each period. While the photographs are not contextualized or combined with captions that explain what we see, these encyclopedic texts include both visual and textual representations. They present future loss in the world. They function as threshold texts, both because they appear in between a shift from one decade to another and because they provide information about how various species have evolved and died out from 2026 onward. That is, they constitute stages and transitions in the Anthropocene towards the end of ecology where everything becomes static and soundless, as is shown in the last graphic representation (Fig. 6) and recalled in the two last poems.

The word *encyclopedia* (from Latin, *encyclopaedia*) can be explained literally as a cycle or branches of knowledge in a particular field that is presented in a comprehensive manner. In the *Cambridge Encyclopedia of Language*, “encyclopedia” is defined as “a book or set of books containing many articles arranged in alphabetical order that deal either with the whole of human knowledge or with a particular part of it, or a similar set of articles on the internet.”⁴ In this sense, the texts in *Astroecology* perform a different function in the work’s presentation and exploration of the evolutionary process towards the astroecological collapse than the graphic representation and the poems. Further, this definition of *encyclopedia* underlines the fact that the texts are representations of human epistemology in print media. I will briefly focus on this specification of a particular media, “book” or “books,” and the production of knowledge specified as “human knowledge.”

Books and “articles on the internet” are involved in determining the conditions for knowledge production; and both reveal a rather conventional epistemology. Moreover, “books” denote knowledge production (and the production of humankind) in the “Gutenberg galaxy” (McLuhan 1962). Jonas Ingvarsson, amongst others, has argued that in the digital era, print books are no longer regarded as the main media for the production and distribution of knowledge (Ingvarsson 2020). Rather, books have become one medium among many. The *Cambridge Encyclopedia of Language*, for instance, is an online encyclopedia, which means that it serves as proof of the need for an alternative definition and a movement away from a book-centered understanding of the genre. Similarly, *Astroecology* is an online work; but it is also a media-ecological work. The encyclopedic texts are materialized in several

⁴ <https://dictionary.cambridge.org/dictionary/english/encyclopedia> (13 December 2022).

medializations of the work, including as print, index cards in an art installation and digital texts. In other words, the encyclopedic texts underscore the media-ecological situation of poetic projects like *Astroecology*. Even though it is a poetic work, it plays with the genre of the encyclopedia as a non-media-specific genre.

Relevant in this context is also the idea that encyclopedic texts represent *human* knowledge. In this respect, encyclopedic texts are anthropocentric in origin. They are, or were, written by and for humans; they reflect a human culture and the human way of organizing knowledge about the world; and they participate in producing and confirming the world as a human world. To some extent, these criteria also hold true for *Astroecology*.

Astroecology's encyclopedic texts are conventional in form. Each article is organized as if it were an article in a print book. In other words, the articles follow conventions that are developed in print culture. An illustration is shown on the left-hand side, while the text is on the right-hand side. The articles contain names of relevant species in Latin and in Swedish – or English or Danish, depending on in which language one chooses to read the work. Furthermore, the articles include information about each species' distinct qualities. There are short stories that explain how the species in question became extinct. Parts of the information are scientific. For example, it is said about the blue whale, which appears on the screen on the threshold between the year 2026 and 2036 (see Fig. 8), that it is the largest animal that has ever lived on the planet and that it has a known lifespan of over 80 years. This is factual knowledge about the species, knowledge that is developed through an anthropocentric worldview, i.e. the species as humans see and know it. This non-fictional information about the blue whale is combined with a fictional staging of a possible future: "The last blue whale was hunted into a shallow bay in the Arctic in 2026, where she beached and expired after several hours struggle to return to deep waters."

This encyclopedic text is interesting for several reasons. First, it contains a description of a death struggle that could have happened but where the dating of the event to the year 2026 is fictitious. The image of the struggling blue whale trapped in a shallow bay finds its parallel in the fate of a mouse that, according to one of the poems, was found stuck inside of a bottle: "a plastic bottle with a dead hazel mouse in it. It had found its way through the opening but could not get out." (#2066) Neither of the two animals was able to find its way out. The blue whale's struggle is both an imagined description of the whale attempting to free itself and an allegory of the situation faced by all human and non-human animals in the Anthropocene. Secondly, the text says that a non-identified subject or force hunted the blue whale. It is likely that this force is an effect of changes in the whale's natural habitat, represented here through the technique of personification. Third, the



Fig. 8: One example of an encyclopedic text in the digital part of *Astroecology*.

information about the last blue whale is interesting because it reinforces *Astroecology* as a work that assesses and presents tragic future scenarios, that is, as a form of a “risk society” (cf. Beck 1992). *Astroecology*’s structure can be thought of in terms of “what if” and “as if.” It is likely that the blue whale will die out at some point in the future, which means that the story remains a possibility, a form of (science) fiction that, because of evolution, will at some point turn into fact. Still, there is no proof that suggests that blue whales will die out in the year 2026. And yet, this scenario *feels* true. The epistemological change that is brought forward when fiction feels like it is true occurs because it is not the exact year of the last blue whale’s death that matters but rather the very idea that blue whales will die out, that the blue whale’s final struggle will take place, just as if it had already taken place. Fourth, it is worth mentioning that the text is written from an imagined future perspective, where 2026 is already in the past, hence, the temporal form of verbs like “was hunted”. Nevertheless, the text puts the future, the year 2026 and the extinction of the blue whale, into a present now and shows how our knowledge of and feelings in the present are filled with expected future events. Whether one read the work in 2023 or 2033, it offers a space in which to experience the feeling of a possible future and possible loss.

While the blue whale is presented as somewhat passive with respect to the changing environment, another text endows *Vulpes vulpes* with human-like agency. This text also begins with a classifying definition of the fox as species, before it reveals that the fox has developed the ability to think systematically and act relationally towards its surroundings. The presentation establishes a parallel to early civilizations in human history:

fox, *Vulpes vulpes*, four-legged animate object. In 2028 they began to construct simple bridges across ditches and streams. A few years later they were extinct. Afterwards intricately woven straws were found in their burrows, signs of handicraft or art; in the field they dug a shallow network of canals, perhaps a replica or map of the archipelago in a nearby lake. (2036)

Temporal phrases such as “in 2028” and “a few years later,” as well as the adverb “afterwards” refer to a historical chronology. Together with the positioning of the event in the year 2036, this aspect serves as an archived micro-narrative that fills the gap between two decades in the macro-narrative. The text explains that the fox has developed characteristics and qualities that we usually associate with abstract and complex thinking, and that it performs actions that we would associate with actions performed by humans in previous civilizations. The notion of a non-human world and a civilization created by animals challenges the inherited understanding of encyclopedic texts as anthropocentric knowledge.

In contrast to the text about the blue whale, this text does not provide information about why or how *Vulpes vulpes* became extinct or how it evolved into an advanced species that constructed complex systems and made arts and maps of archipelagos in nearby areas. Perhaps future evolution is the only explanation for this development, where the text presents a narrative parallel to human history, as if the fox had taken the place of humans in a social, cognitive and artistic hierarchy. The fox strengthens its position in the ecosystem and utilizes its natural habitat to reinforce its ability to survive. It develops a sense for aesthetics and has an urge to discover new lands, systematize the knowledge of these lands and, perhaps, in the absence of humans, colonize the land (and planet). The position that the fox has conquered, makes it dominant and gives it the ability to develop knowledge that, in the history of humankind, is defined as anthropocentric – knowledge of the world from the human point of view. Still, despite or indeed because of its ability to make its species stronger, the fox also disappears.

In *Astroecology*, the fox and other non-human species develop human-like features. Still, they are not anthropomorphized. Rather, we can read these texts as explorations of how evolution would go if, or when, humankind disappears and leaves the planet to animals and other organisms. One consequence of such an exploration is that *Astroecology* raises questions about the relationship of all species to their environment and the validity of our cultural distinction between human and non-human animals. Moreover, the world of *Astroecology* appears as a more-than-human world. In Morton’s concept of the mesh, the distinction between nature and culture, humans and other organisms, is blurred and questioned. Similarly, Giorgio Agamben argues in *The Open: Man and Animal* (2002) that human history views human beings as separated from other animals. This argument provides the foundation for one of Agamben’s central concepts, “the anthropological machine.” According

to Agamben, we have now reached the point where the distinction between humans and other animals is being called into question. Or, in Agamben's words, this distinction is now "in the open." We find a similar eco-philosophical position in Heldén's *Astroecology*. The work proposes a future where some animals, due to evolution and their own conditions, have developed characteristics that enable them to make crafts and art and to mime structures discovered in landscapes distant from their natural habitat. In this way, we can regard the work as a representation not only of a possible future but also of a future in which the anthropological machine has been replaced by an evolution that shows the species' existence and its behavior, skills and final destiny in a non-human world.

Observations out of time and place

While the poems represent observations and embodied experiences of changes in the landscape, the photographs and encyclopedic texts could be mediated observations, field notes made from someone or something positioned outside of the landscape. As I have mentioned, in *Astroecology* different species and a landscape, possibly the whole planet, are "uplifted" into a spaceship, only to be observed by one or several subjects. The work does not say anything about who these subjects might be. There is no information about who has taken the photographs, written the encyclopedic texts, archived them, explored and experienced the landscape and written the poems. Neither does it say for whom the photographs, encyclopedic texts and poems are meant, nor is there any information revealing who – if anyone or anything at all – is watching the monitors on the wooden desk.

This situation reflects various levels of mediation. One can imagine the reader positioned behind her computer screen, the computer placed on a wooden desk perhaps, watching the image of the two monitors on the wooden desk. One of the monitors shows the appearance of the poems, the appearance of which reflects a process of mediation. The poems appear on the surface of the screen because of the action conducted by the reader on her computer and because someone, or something, perhaps a computer, has written them. Likewise, on the other monitor, the world appears mediated and remediated through a surveillance system, as photographs, and through the writing and graphic illustrations in the encyclopedic texts.

These layers of mediation and remediation emphasize the process of creating, of representing and of viewing. We might call this a situation of hypermediacy. According to Jay Bolter and Richard Grusin, hypermediacy reminds the reader of the media involved in the work (Bolter and Grusin 1999, 272) and, therefore, makes the reader conscious of the act of seeing. In *Astroecology*, we are immediately made aware of the presence and the position of an observer. The reader is not told who

this observer is but can see and read what the non-identified observer can see and read. This position is anachronic, outside of history and outside or beyond the time and place of evolution. It could be the position of the narrator looking into the diegetic world. Nevertheless, it is a “supernatural” time-place, which allows one or more subjects to experience the development without being part of it. It is a time-place out of joint, we might say, to paraphrase Hamlet, after being haunted by the ghost of his father. Philip K. Dick uses the phrase as a title in his novel from 1959 to refer to how events in the narrative are supernatural. We also might recall Derrida who uses the phrase to signify anachronism, how the past, and more to the point, the ghost of Marx, haunts our present (Derrida 2006). In *Astroecology*, a ghost from the past and future haunts the present.

With the monitor space, Heldén creates a framework for mediations and establishes a mixture of materiality: the imitation of wood combined with electronic devices. He puts into play traditional and “new” materials and media, a reflexive use of materials that is also recognizable in his other works. The opening page in Heldén’s *The Prime Directive* (2006), for example, shows an image of two books circling around their own axis. They are of course not books but digital images of books, which in *The Prime Directive* constitute entrances into the work’s two sections. Rather than being understood as opposites or competitors, the combination reflects a desire to create connections across material, medial and cultural lines. In *Astroecology*, the monitor position highlights the media event as a process towards the collapse, and it emphasizes that what is shown is an experiment. Still, just as much as the position could be the position of scientist, conducting the experiment, the desk could be the author’s. The image reflects a widely used rhetorical *topos*, the author’s desk. However, in science fiction and in a technopoetic worldview and the computational network environment the scientist and the author could just likely be a computer.

In one of the print poems in the book *Astroecology*, we read: “We built an AI, its purpose was to replace me.” (2016b, no. 34) The statement can be read as an intratextual reference to the work *Evolution* (2014), where Heldén and Håkan Jonson developed a poetry machine with the intention of replacing the poet Johannes Heldén (cf. Chapter 2), but it may as well be meant for the work and world of *Astroecology*. In the latter case, it is fair to interpret “me” as a human being that has been replaced by AI as the one who monitors the elevated landscape on the screen, who writes the future encyclopedic texts and collects and archives the photographs of the past. The pronoun “me” might refer then to the last human speaker.

Further, it is likely that the AI is involved in the production of the poems. In her article about *Astroecology*, Roberg writes that the work establishes an uncertainty as to whether the poems were created by a human or a machine (see also Roberg 2019, 11). Nevertheless, artificial intelligence and algorithm as co-authors

of the poetic texts are less prominent than in *Evolution*, in favor of a representation of post-anthropocentrism and the thematization of nature and evolution in the Anthropocene.

Astroecology is a technogenetic work, a collaborative work by humans and non-humans. The text thematizes this collaboration. The observation post looks like a human space, the encyclopedic texts create a continuum between the human and the non-human, and the photographs might be taken by a human or a non-human and archived by the AI. Further on, in most poems, a grammatical subject is missing. It says, for instance, “The landscape elevated”, “The vegetation spreads”, “Here the end of consciousness, the collapse of spaces, or the logic of the seasons,” “Trying to make brick,” and “Burning the formless blocks.” One of the few exceptions from this is found in a poem that refers to an “I” who found “a plastic bottle with a dead hazel dormouse inside it.” The dead hazel mouse is, as I discussed earlier, an emblem of the fate of humans and other organisms in the Anthropocene. They are trapped in evolution, an evolution that takes place within a closed ecological system; they cannot find a way out of the linear development of evolution.

Other poems emphasize an embodied presence that makes visible sensations and an affective and cognitive subject. In one of the poems, it says “[d]own below, heavy footsteps head home” (#2096) and in another “[t]he raindrops leave black trails on the forearms” (#2126). The reference to the sound of what could be a human body moving downstairs, presumably in a house, and the visual trace rain on a forearm is surprising since elsewhere the poems and the work depict a world without human beings. Nevertheless, from a technogenetic perspective, the subject is both human and non-human. A poetic subject observes and writes down what it sees; it hears and feels. In this respect, what I call a technogenetic subject appears as open, explorative and prophetic, one who simultaneously sees what has happened and knows what is going to happen.

Field recordings and technogenetic subjects

Astroecology is a response to the Anthropocene and represents an alternative strategy for dealing with the experience of evolution. There is a sense throughout the work that the future is already present. The work displays and performs knowledge of our past, present and future through multiple temporalities. The work moves linearly towards an imagined future by an interval of ten years, from 2016, which is the starting point of the work, till its ends in the year 2156. In this way, a geological time is reflected as the dramatic changes in the landscape slowly take over and erase traces of human activities: the house, the garden, the fence and the path that went through the forest. In this respect, the linear organization and

progression serve a particular purpose. Textual, visual and audio representations are predetermined in the work, and the reader cannot interfere with the outcome, as if the future is already destined. The reader can only, less intentionally, decide the order of the appearances of words in the poems, photographs and texts. This lack of the reader's ability to interfere has its analogy in the narrative about evolution and the astroecological collapse in the work. The work encourages, or should we say forces, the reader to engage in the narrative, even though the reader has no influence over the progression of the evolution of the world. This creates an interactive engagement that does not contradict the presentation of evolution and the Anthropocene as phenomena and conditions that have put humans as subjects on the sidelines. Rather, it emphasizes that human actions have intervened in evolution and continue to do so, even after human subjects have disappeared from the planet. To this linear presentation of evolution, the work adds a circular rhythm as the world shifts between day and night. Furthermore, poems, photographs and encyclopedic texts add past, present and future times. They appear as punctual elements and as archival documentation, establishing how the history of the planet, i.e. the planet as it was, may develop in the future. Additionally, the poems present a dense and heterochronic now, which in itself brings together past, present and future sensations.

According to Bruno Latour, linear time is the time of the Anthropocene (Latour 2018). He argues that the Anthropocene has affected our conception of time and, not least, future prospects. It seems, Latour writes, that it seems as if in the Anthropocene we have become more aware of how human activities have affected our perception of the temporal structures on the planet and that we by that have entered a time-space where multiple temporalities have no epistemological value. Furthermore, Latour claims that the Anthropocene calls for a collective metanarrative that brings together temporal diversity. As Ann-Louise Sandahl puts it in her critical presentation of Latour's notion: "now all people on earth are forced to live at the same time, whether they want to or not." (Sandahl 2016, 37) Sandahl shares Latour's view that every entity on earth, humans, organisms and objects are incorporated into this new time scenario of the Anthropocene. However, she argues against the idea that the time of multiple temporalities in the arts is over. *Astroecology* has a fluid timeless time, where the past, present and future are intertwined and exist simultaneously. Rather than a disruption of the linear development in ten-year intervals, these heterochronies supplement the linear narrative that human and non-human animals share. They fill the linear time with other conceptions of time. Overall, they imply an ecological thinking that transgresses conventional temporal conceptions.

Astroecology demonstrates how poetry in the computational and network environment can respond to the Anthropocene as a time-space where both past and

future are present whether we like it or not. Heldén and *Astroecology* implicitly present an argument about the necessity of temporalities other than linear time in order to understand and fill with meaning the geological narrative that transcends the time of humankind. In the world of *Astroecology*, the observatory space, the world on the monitor, the poems, the photographs and the encyclopedic texts are all results of a collaboration of subjects that cannot be traced back to either humans or non-humans alone. For instance, the poems bring together not only sensations, experiences, events, intensities and knowledge in the evolutionary process that takes place on one of the monitors but also a larger timespan and a more complex, heterochronic structure in which future sensations are not only produced by humans. Therefore, *Astroecology* is a world and a work of ecological relationships. This is a relationship that includes humans and non-humans but one in which the distinction between human and non-human animals, other organisms and artificial intelligence is no longer of any epistemological value.