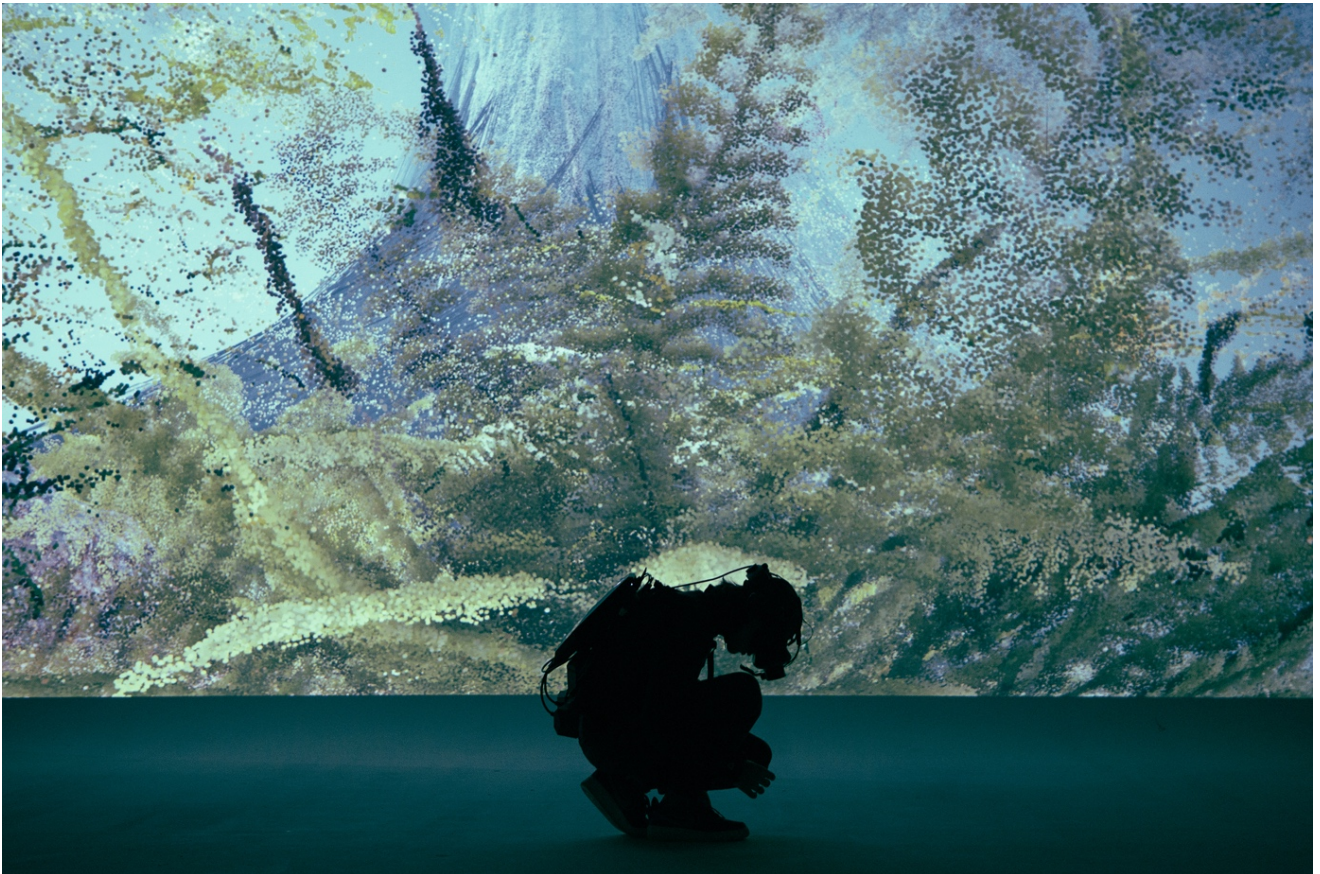


FEMINIST SPECULATIVE FUTURES

Imagination, and the Search for
Alternatives in the Anthropocene



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Thesis Statement

The ongoing social and ecological crises have brought many people together around an urgent quest to search for other kinds of possibilities for the future, imagination and fiction seem to play a key role in these searches. The thesis engages the concept of imagination by considering it in relation to *feminist SF*, which stands for science fact, science fiction, speculative fabulation, string figures, so far. (Haraway, 2013) The thesis will engage the ideas of feminist SF with a focus on the works of Donna Haraway and Ursula Le Guin, and their approaches to the capacity of imagination in the context of SF practices. It considers the role of imagination and feminist speculative fiction in challenging and converting prevalent ideas of human-exceptionalism entangled with dominant forms of Man-made narratives and storylines. This conversion through feminist SF leans towards ecological, nondualist modes of thinking that question possibilities for a collective flourishing while aiming to go beyond the anthropocentric and cynical discourse of the Anthropocene.

Cultural experiences address the audience's imagination, and evoke different modes of thinking and sensing the world. The thesis will outline imagination as a sociocultural, relational capacity, and it will work together with the theoretical perspectives of feminist SF to elaborate upon how cultural experiences can extend the audience's imagination to enable envisioning other worlds, and relate to other forms of subjectivities. For this purpose, I will consider how through the cultivation of cultural experiences, different social actors play a role in creating certain storylines that shape the collective imaginaries. I will offer a practical involvement with the ideas of feminist SF by providing an analysis of the contemporary artworks *Metamorphosis* by the researcher and artist collective *The Institute of Queer Ecology (IQECO)* and *We Live in an Ocean of Air* by *Marshmallow Laser Feast*.

Demonstrating a sociocultural undertaking of imagination by feminist SF practices, the thesis will engage Haraway's use of the concept of the cyborg as a figure within the game of string figures (SF). Cyborg is emblematic of Haraway's re-configuring of human-nonhuman relations; it is a figure of imagination, and a theoretical trope into material realities. Working together with the feminist SF metaphor of string figures, I will engage contemporary artworks based on their creative approaches to ecological relationships and goals of re-imagining human and nonhuman, human-earth relationships. I intend to offer a critical analysis of the artworks,

focusing on whether the artworks guide the audience's imagination to facilitate a relational, more-than-human understanding of the world. I will do so by questioning how the exercise of imagination provided by the artworks might support a critical mode of thinking to confront the social, cultural, historical processes and narratives that contribute to human-exceptionalist ideas and petrocapiatist ideals that subtly govern our interactions with the world. Importantly, by viewing the artworks within a broader cultural, art, and museum discourse, my goal is to offer a series of critical observations with referring back to the theoretical engagement of feminist SF practices.

Keywords

Feminist SF, cyborg, imagination, imaginaries, speculative futures, storytelling, Anthropocene, more-than-human, nonhuman

Cover

Image from the virtual reality experience *We Live in an Ocean of Air* (2019) by Marshmallow Laser Feast

Table of Contents

Introduction

Preparing a Ground for the Exercise of Imagination	6
Chapter Overview	8
Theoretical Framework and the Ideas of Feminist SF	10
Notes on Methodology	12

Chapter I

Framing Imagination as a Relational, Sociocultural Capacity in the Context of Feminist SF

An Outlook on Imagination	17
How does Imagination Travel?	20
Situating Alternatives	24
Feminist Storytelling, Imagination, and SF	29
Imagination and Relating to the (Nonhuman) Other	33
The Cyborg: A Turning Point for Feminist Imagination and Feminist Technoscience	37

Chapter II

Figures of Feminist SF, The Cyborg and Deconstruction of Prevalent Stories

The Carrier Bag Theory of Fiction and Feminist SF	43
Noticing Big Enough Stories	48
The Cyborg to Convert Prevalent Imaginaries of Technoculture	56
Playing String Figures for Shared Futures	64

Chapter III

Contemporary Artistic Approaches on Imagining Alternatives: an analysis under the framework of Feminist SF practices

An overview of the Case Studies	67
<i>We Live in an Ocean of Air</i>	68
- Introducing the central concepts through the guided meditation	70
- VR experience of the Artwork	74
- Critical Observations on the Aesthetic Interaction, Situating the Artwork within a Broader Cultural, Artistic Discourse	79
<i>Metamorphosis</i>	89
- Introduction (<i>Serotiny</i>)	90
- Larva Stage (<i>Grub Economics</i>)	92
- Pupa Stage (<i>Liquidation</i>)	94
- Imago Stage (<i>Emergence</i>)	94
- Proposal for a Speculative Future	95
- Critical Observations on the Speculative Potential of the Artwork	97
Conclusions	
Reflections on the Contemporary Artworks and Playing the Games of Feminist SF	102
Practical Involvement with the Ideas of Feminist SF	104
Limitations of the research and Potentials for future research	107
References	111

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Introduction

Preparing a Ground for the Exercise of Imagination

“I think the imagination is the single most useful tool humankind possesses. It beats the opposable thumb. I can imagine living without my thumbs, but not without my imagination.”

Ursula Le Guin- *The Wave in the Mind*

“Other Worlds have existed in many cultures, within which they can trace many separate literary and cultural lines of descent. Could it be that the tendency to produce such worlds is an essential property of the human imagination, via the limbic system and the neocortex, just as empathy is?”

Margaret Atwood- *In Other Worlds: SF and the Human Imagination*

There is a sense of relief in reading a piece of writing, or hearing the lyrics of a song that resonate with your thoughts. After coming across to an accurate description provided by someone else, only then it becomes possible or somewhat easier to make sense of a feeling or an experience. Recently, I came across to a sentence by the anthropologist and design scholar Anne Galloway. She was mentioning the difficulty of living in a “culture whose dominant values you do not share, to live in a society you do not think works well,” it is a struggle she adds, for every single day. Writers, artists, scholars have faced with the same struggle in their own life time. It has been a widespread sentiment that has been shared by many, and continues to be so.

In the beginning of the COVID-19 pandemic, when the cities around the world were starting to shut down and academic conferences were taking place online, I remember that some academics and artists saw in the time of the crisis, a possibility for collaboration and solidarity. More than a year into the global pandemic, the economic and social inequalities within societies, amongst different geographies have become even more apparent with more individualization, racial discrimination, unequal access to health and public services. While

lockdowns were taking place, the last year has seen a substantial growth in the deforestation levels around the world. In 2020, a big part of the tropical forests, in Amazon, in Congo, and South Asia have been lost, in total, it is specified as large enough to cover the entire area of the Netherlands. (Harvey, 2021)

Living in a time of the loss of irreplaceable ecosystems, climate change, pandemics, and social, ecological degradation, I often find myself getting caught up in a pessimism, perhaps aligned with a larger mode of despair shared by others as well; caused by the feeling of inadequacy to cope with these complicated problems. Within this cycle, it is not hard to end up with apocalyptic expectations. However, this is a dangerous pattern in thinking, as apocalypse or ‘the end’ becomes the only focus, introducing an end to thinking within thinking itself. It is the inability to think that derives banality¹. It is thoughtlessness that blocks the ability to recognize the connections, important questions, entanglements, how life and death matters. “The world does not matter in ordinary thoughtlessness.” (Haraway, 2016, p. 36)

The “game over, too late attitude” (Haraway, 2016 p.56), is observed by Donna Haraway within the human-centered discourses around the Anthropocene, which offer a limited and readily-determined story of the shared presents and futures. Complex socio-ecological problems might leave us cynical about the future. But rather than being stuck, we should also concern ourselves with the question of what happens beyond apocalyptic thinking? Being under the influence of the dominant mode of fear and despair, not only leads to a confinement from the ability to think, but also to a confinement from the ability to ask critical questions that should confront the present-day order, the social, historical dynamics and processes, stories and narratives that play a part in shaping the crises of the contemporary. The mode of panic and fear not only risks blocking the ability to think but also risks the ability to imagine, retaining us from asking for other possibilities, to make room for other kinds of stories.

¹ In *Staying with the Trouble* Donna Haraway views the contemporary crises and the Anthropocene discourse, through the lens of Hannah Arendt’s analysis on Adolf Eichmann’s trial for his Nazi war crimes. She draws on the insights from Arendt’s observations. Behind Eichmann’s evil actions Arendt found an inability to think. Looking into the crises of the contemporary moment, Haraway realizes that the inability to think results in a kind of misalignment, a mode of losing sight on how the earth, how entanglements, connections, death and life matters. She encourages her readers to think. She adds “Revolt! Think we must; we must think. Actually think, not like Eichmann the Thoughtless. Of course, the devil is in the details—how to revolt? How to matter and not just want to matter?”(2016, p.47)

This thesis tackles the concept of imagination as a relational, sociocultural capacity and builds its questioning on imagination in the scope of theoretical perspectives of feminist SF practices. Feminist SF is a “mixed-up category” (Anderson, Backe, Nelms, et al., 2018, para.1) that involves multiple modes of making, thinking and storytelling. Donna Haraway describes feminist SF as collective practices that resemble the game of string figures (SF). The goal of feminist SF practices that I aim to focus on in the scope of this thesis, can be best explained as a creative one that strives to initiate alternative modes of thinking to confront ideas of human-exceptionalism, masculinist, competitive mentalities govern the mainstream social, historical discourses through a critical and creative exercise of imagination. The primary goal of this thesis is to involve a critical analysis of contemporary artworks *Metamorphosis* and *We Live in an Ocean of Air*, to consider how a non-linear framework of imagination can be activated and informed by the ideas of feminist SF practices that aim at going beyond reductionist, human-centered stories that perpetuate the modes of (non-human) Othering. Based on the stated goals of the thesis, I will build my analysis around my main research question “how do the chosen artworks illustrate the ideas presented within the realm of feminist SF practices?”

Chapter Overview

In the first chapter, I will offer a conceptual analysis on imagination by covering the research in sociology, sociocultural psychology, and philosophy, considering how imagination functions as a dynamic link between individual and social, cultural levels of experience. In this chapter, I will outline a non-linear, sociocultural framework of imagination. In order to align the framework of imagination with theoretical perspectives offered by the feminist SF practices, I will introduce Donna Haraway’s main ideas around feminist SF which include feminist storytelling and fiction. In doing so, my goal is to demonstrate further how feminist SF engages artistic, scientific practices, and fiction as sites for imagination and how these engagements play a part in relating to other kinds of worlds to build insights for realizing and telling alternative stories. At the end of the chapter, in order to build a better insight on how feminist SF practices incorporate imagination and fiction as means for ‘flipping the script’ on the dominant masculinist, human-centered narratives I will offer an introduction on the historical background on Haraway’s use of the cyborg concept.

In the second chapter, I will focus on how the feminist SF practices help support a non-linear, sociocultural framework of imagination. Ursula Le Guin's "Carrier Bag Theory of Fiction" (1986) and the cyborg figuration will be critical points of engagement to this question. The short essay by Le Guin hints at how the established historical scripts lead to linear, progressive, masculinist, competitive mentalities that limit our collective imagination and how such readings of the history can be challenged and converted through telling other kinds of stories. In this chapter, the engagement of Haraway's use of the cyborg concept will help me to unpack how feminist SF practices offer alternative narratives to human-centered, stereotypical masculinist, dualist thinking and how sociocultural criticism through imaginative work of feminist SF takes place.

The last chapter will introduce the chosen case studies from contemporary artworks: *We Live in An Ocean of Air* by the interactive media art collective *Marshmallow Laser Feast* and *Metamorphosis* by the art and research collective *The Institute of Queer Ecology (IQECO)*. The analysis of the case studies will follow the main research question and will be evaluated on the basis of the ideas presented in the context feminist SF practices, following the relational, critical and sociocultural aspects of imagination. The first case study *We Live in an Ocean of Air*, takes place as a guided meditation and a VR installation, which aims at making visible the connection of air between plants and animals. The multisensory experience aims at leading the audience's imagination to allow them relate to other beings in a forest within the immersive VR environment. The second case study, *Metamorphosis*, is a video-series formed as a speculative future proposal. The three-part of the video series takes shape around the metaphor of the process of metamorphosis. The film considers imagination as a critical tool to question and go beyond the hidden social and historical processes behind the socio-ecologic crises of today while questioning the dominant stories and favored narratives put forward by certain social actors. The film intends to transmit a sense of hope that transformation from the present-day order is possible.

I will analyze the artworks for their potentials to encourage the realization of other forms of subjectivities and their capacity to encourage alternative ways of thinking by guiding the audience's imagination. During the analysis of the artworks, I refer back to insights from feminist SF practices and the cyborg figuration, keeping in mind that creative and artistic approaches to the socio-ecological problems come from a place of being situated within a sociocultural, material, and political context. Taking a critical distance in my analysis, I will

situate the artworks within a broader context of artistic and creative approaches to the Anthropocene. Through an analysis of the artworks, I intend to offer a series of critical observations. These observations concern the contemporary creative and artistic approaches to more-than-human worlds and speculative futures.

Theoretical Framework and the Ideas of Feminist SF

The theoretical framework of the thesis is informed by Haraway's non-dualistic way of thinking that embraces *ongoingness* and challenges the established categories of human-nonhuman, male-female, nature-culture, and organic-technological binaries. (Haraway, 2015, p.41; Kenney, 2017, p.73) This way of thinking informs her understanding of the feminist SF practices that strive to find other possibilities for a collective flourishing in the future through combining sociocultural criticism with imagination and fiction. According to Ursula Le Guin (2004), fiction is imagination built upon experience. (p.222) It offers an effective tool for criticism because it allows to create reflections and representations of discontentment without actually pointing out to them. In this sense, irony can be considered as a companion to the exercise of imagination.

The two artworks will be analyzed to explicate how the critical reassessments of the world might be supported and transformed through the creative and generative potential of imagination and fiction, an idea that the thesis finds core to practices of feminist SF. To better explain this idea, the thesis will engage Haraway's ironic use of the cyborg, a figure of feminist SF, which has intended to present a challenge to the deepened dualisms that she noticed in the works of feminist writers and cultural theorists. (2004, p.13) In "The Promises of Monsters," Haraway addresses how binary pairs lose their oppositional qualities when moved beyond the premises of enlightenment and how SF might allow for the possibilities of new concurrences.

"When the pieties of belief in the modern are dismissed, both members of the binary pairs collapse into each other as into a black hole. It will take a superluminal SF journey into elsewhere to find the interesting new vantage points." (Haraway, 1992, p. 330)

Feminist SF involves a tactic of converting dominant stories, prevalent scripts, and ideas that glorify the "generic masculine universal." (Haraway, 2016 p.51) The glorification of such

ideas is at the center of feminist criticism and is rooted in the views of human exceptionalism. This tactic of converting the prevalent forms of thinking through creative interventions shaped around imagining and storytelling is the main goal and the logic of feminist SF that activates and embraces the concept of imagination as a sociocultural capacity.

To delve further into what feminist SF entails and consider how the feminist SF practices function by combining cultural criticism and the sociocultural framework of imagination, I will point out Haraway's use of the concept of the cyborg. This analysis will demonstrate how feminist SF undertakes a reversed tactic to construct alternative modes of thinking aimed at challenging prevalent anthropocentric, androcentric worldviews. Ignoring the irony and cultural criticism behind Haraway's cyborg figuration leads to a flawed understanding, which suggests that the cyborg solely represented a utopian perspective that glorifies the emancipatory potential of new technologies. This point will be essential since I aim to point out the complexities and the dangers the cyborg figuration embodies, together with my analysis of the artworks.

"We live in a thick present," Haraway asserts (2016, p.297), and the cyborg exemplifies her point with its theoretical and creative potential despite its "dubious origins." (Åsberg, 2010, p.20) The cyborg shows that engaging in future imaginings is a political and uncertain undertaking that bears many possibilities with no fixed endings, hinting at the ongoing, collaborative characteristics of SF practices. Haraway's nondualist outlook on the human-nonhuman relations is present within the cyborg figure as it blurs the boundaries between organic and machinic, human and animal. With this aspect, the use of the concept of cyborg by Haraway highlights her wish to reconsider human-nonhuman relations, which set the ground for her inquiries on interspecies relations and her proposal for multispecies collaborations.

For Haraway (1985), a possibility for flourishing in the future may be born out of realizing joint kinships with others (including the cyborg). (p.15) The exploration for these possibilities is a quest that is central to feminist SF and aims to lead the search for creative and thoughtful ways of relating to the (nonhuman) Others. The repercussions of such interests are prevalent across the fields, with examples of speculative and more-than-human approaches to design and ethnographic research, environmental humanities, and social sciences focused on exploring ecological interactions, finding examples from 'natural-cultural contact zones.' (Kirksey, Heimreich, 2010, p. 564). In the last years, studying the relationships between humans

and other-than humans has attracted more attention simultaneously with future-oriented, speculative arts and design approaches. The works of feminist scholars, in particular, have influenced these efforts for imagining other possibilities in the Anthropocene, as exemplified with the chosen artworks: *Metamorphosis* and *We Live in an Ocean of Air*. The feminist SF figure of the cyborg represents our complex relations and entanglements with technologies. The dangers and complexities ingrained within the cyborg, symbolizing human-technology relations, will be considered present with these artworks that aim to inspire ecological, interrelated modes of thinking through digital and interactive technologies.

Stating the goals of the thesis through the analysis, I will build upon my main research question: “how do the chosen artworks help illustrate the ideas presented within the realm of feminist SF practices? (e.g., how do the projects provide an outlook on human-nonhuman, human-earth relationships; what could be some of the shortcomings in their approaches?) with additionally posing my subquestions:

-What is feminist SF, and how do the practices of feminist SF conceptualize imagination?

-How do feminist SF practices help support a non-linear, socio-cultural framework of imagination; how could this framework be activated and explained through chosen artworks?

Notes on Methodology

Based on the research questions, the thesis will tackle several concepts. First, it will engage the concept of imagination and its dynamic and ambivalent status in constructing certain social beliefs and worldviews. To do so, the thesis provides a conceptual analysis of imagination to outline a non-linear model that considers imagination an individual and cultural phenomenon. As Mieke Bal (2009) asserts concepts are not ordinary words. (p.19) According to Bal (2009), concepts have a dynamic and even ambivalent status; they are not fixed. Concepts travel between different disciplines, between the works of the individual scholars, and across different academic communities. (p.20) Bal (2009) notes that concepts become third partners to the symbiotic interaction between critic and object. In this sense, the

conceptualization of imagination as a sociocultural phenomenon will become a connective component in my engagement with the chosen case studies, viewed in the context of feminist SF practices. It is often specified that within the procedure of conceptual analysis, description and analysis of model cases can be used as part of the method. (Petrina, 2016, p.5) In relation to this, the thesis will consider how specific cultural experiences create and take part in giving shape to collective forms of imaginaries with the analysis of the artworks.

Secondly, the thesis will engage the cyborg concept and outline how it exemplifies the motives of feminist SF for blurring the classical boundaries and questioning the established analytical categories. The cyborg concept has traveled from science fiction to be employed by cybernetics research in the 60s. Later on, the cyborg has acquired a critical place within cultural theory together with Haraway's conceptualizations of feminist SF practices. The thesis will closely engage Haraway's use of the cyborg concept, as it reflects the intentions for giving rise to new kinds of relatedness to other forms of subjectivities. This motivation is embedded within the ideas embraced by feminist SF, and it also shared by the chosen case studies. While the cyborg figure allows for recognizing the dangers of technocapitalism, and possibilities situated within the practices of imagining ecological, technological futures, it represents another node within the collaborative practices of feminist SF, which integrates collaborative forms of imagining, and making resembling playing string figures, SF. (Haraway, 2013) Thinking together with the metaphor or the string figures for SF practices, my aim through including the case studies is to consider these artistic approaches as other possible nodes or extensions of the consequential, at times dangerous (e.g. the cyborg) yet ongoing games of feminist SF.

Chapter I

Framing Imagination as a Relational, Sociocultural Capacity in the Context of Feminist SF

In 2000, scientists Eugene F. Stoermer and Paul J. Crutzen coined the term Anthropocene to describe a new planetary era marked by anthropogenic climate changes. Anthropocene intends to define a new geological epoch in which human activity has become the primary driving force behind the geological, climatic, ecological changes. (Shaw, 2018, para.1) A lot has been written and told around the concept of the Anthropocene within the last twenty years. The term has raised some questions for being centered around the ‘Anthropos,’ the Greek word for the human. (Crist, 2016, p. 16) Hence, the concept of the Anthropocene, with its centralization around the conception of Anthropos, has been deemed too narrow and diffuse. While a generalization of “the human” is made under the term, its focus on the Anthropos has been brought into attention for not paying enough consideration to acknowledge and consider the nonhuman elements that are entangled with human activities on the planet (Shaw, 2018, para.2). Although the concept of the Anthropocene has provided a helpful framework to make sense of the growing impacts of human activity on earth, the term has also been criticized for leading a unilateral framing of the past and present condition, and the future of the planet, and therefore blurring the sights for creating other possibilities for the future. “The term Anthropocene seems to be already overdetermined, hailed by physical, life, and social scientists as either (or both) the end of history as we know it and the beginning of the future as we want it.” (Glabau, 2017, p. 541)

As socioecological problems present us with ever-growing and complex global challenges, the calls for simulating radical changes in our understandings of our relationship with the world and the need for other visions for the future have been voiced more frequently. In this regard, scientists and humanities scholars are increasingly questioning “what it means to be human in a multispecies world.” (Westerlaken, 2020, p. 266) Artists and scholars are increasingly looking for examples of what can be referred to as ‘biocultural hope,’ as they try to explore different ways of relating to nonhumans. (Kirksey, Heimreich, 2010, p. 545; Alaimo, 2017 p. 96) The works of feminist scholars Donna Haraway, Anna Tsing, have provided an essential starting point to these interests by including art, storytelling, and fiction to explore

interspecies interactions and for thinking through and against nature-culture dichotomies. (Kirksey, Heimreich, 2010, p. 546) These growing interests point out to a search for alternatives to the accustomed ways of organizing life on earth, and imagination constitutes an underlying capacity within these searches. I will start this chapter with a conceptual analysis of the concept of imagination. In order to provide a closer look at the role of imagination in the artistic, scientific, and scholarly approaches that try to develop alternative scenarios to already existing ways of thinking and being in the Anthropocene, I will outline different aspects of imagination and consider it as a creative, constitutive, relational, socio-cultural capacity in this chapter.

Research in humanities and social sciences has often classified imagination as part of human experience. Imagination is often highlighted as a cognitive faculty that separates human capabilities from nonhuman animals. (Abraham 2020, p.15) More recently, especially within the domains of posthuman studies, imagination is explored as a distributed faculty between humans and nonhumans, by looking at the evolvment of human-technology interactions. (Wellner,2018,p.45) I should note that it is not my intention in this thesis to question whether imagination is a cognitive capacity that is only able to humans or not. Instead, I aim to point out how imagination can be considered a socio-cultural capacity and point out how it may be considered an underlying capacity in realizing the relationalities between humans and nonhumans in relating to ‘the Other.’ From a socio-cultural perspective, I will consider the dynamic state of imagination shifting between the individual and the social levels of meaning-making.

The concept of imagination denotes an individual level of experience, while the term imaginary signifies the social context that shapes the individual’s experience. (Bottici, 2019, 433) My goal in this thesis is to approach to the concept from both levels, embracing dynamic and ambiguous characteristics of imagination. For this purpose, I intend to outline the conceptualizations of the term by looking into research concerning philosophy, socio-cultural psychology, sociology and science and technology studies (STS). Although psychoanalytic theories have engaged the notion of imaginary (i.e., Lacanian approach to psyche), this thesis will not approach the term imaginary from a psychoanalytical perspective. I will refer to the works of the scholars such as Shelia Jasanoff (2015) and Charles Taylor (2004) who have studied how the repercussions of various social phenomena are reflected through certain cultural representations and how these representations reciprocally shape and are informed by collective imaginaries.

Cultural experiences create a flow between the individual imagination and influence collective forms of imaginaries. (Zittoun, Glăveanu , Hawlina, 2019, p.12) Based on this idea, I will look at the role of imagination in different aesthetic and cultural experiences, and I will point out to its generative relation to creativity. In parallel, I will consider the place of imagination within the diverse cultural experiences generated by scientific, artistic, and design practices. The consideration of imagination as a social and a collective capacity will be supported by the socio-cultural and psychological analyses of imagination.

As a growing number of heterogeneous actors join the search for alternative futures, more specific and critical inquiry on imagination and collective forms of imaginaries are required. For this reason, I intend to map some of the intersecting future-oriented interests of arts and humanities fields in this chapter. I will also problematize the notion of ‘alternatives,’ bearing in mind the multiplicity of imaginaries cultivated by various social actors confirming their specific agendas. Following my questioning on alternatives, I aim to draw attention to the place of imagination in feminist theory and writings to show how feminists have been making efforts to go beyond established worldviews through imagination and irony. For this purpose, I will introduce Donna Haraway’s understanding of the feminist SF and engage Haraway’s ideas on storytelling which aim to go beyond the ‘prick tales’ of the Anthropocene.

The modern conceptions around science and scientific knowledge, (e.g., within the positivist tradition), focuses mainly on rationality, ignoring the value of other sources of sensuous knowledge, including intuition, experience, imagination. (Mies, Shiva, 2014, p.47) Despite such assumptions that govern the understandings of scientific knowledge, we increasingly see that scientists too rely on sensuous knowledge and imagination. For instance, a scientist might depend on particular affordances while studying organisms’ behavior while studying processes that occur beyond their immediate perception. Such affordances in scientific studies go hand in hand with the scientists’ experiences, intuition, and imaginative thought processes.

A consideration of the functioning of sensuous knowledge, especially imagination in different practices, will lead me to cover the dynamic and constitutive role of imagination in the interdisciplinary endeavors that aim at speculating alternatives to existing human-earth systems (by contributing to the grasp of diverse ecological relationships). In relation to this, I will mention some examples and insights from scientific research and artistic practices.

Ultimately, I intend to provide a more detailed analysis on the concept of imagination and to position it within the multiple artistic, scientific practices that may support our understandings of mixed practices of feminist SF. In this regard, Donna Haraway's work and her ideas on creative, thoughtful, and experimental practices of feminist SF will offer a key reference point.

Consequently, I will turn my attention to the concept of the cyborg. Donna Haraway's use of the concept marked a turning point for feminist imagination and feminist views on technoscience. The cyborg is a controversial figure with its roots in the military-industrial complex. It is posited as an embodiment of imagination, organism, and machine. Keeping in mind the cyborgs' place in Haraway's call for rethinking the dualisms between human-machine and human-animal relationships, at the end of this chapter, I will give historical background on the figure's development and point out Haraway's explicit use of irony embedded within her use of the concept of the cyborg. Despite the controversies around the cyborg figure, Haraway's use of the concept of the cyborg as a genderless feminist figure presents a valuable imaginative resource for explaining and understanding the technopolitical environment of global cybernetic capitalism.

An Outlook on Imagination

First, I will provide an overview of the concept of imagination. In order to do so, we will be covering how imagination has been conceptualized in philosophical, psychological lines of thought and research. Commonly, imagination is defined as a mental faculty, as a cognitive capacity that plays an essential part in human experience. From a cognitive science perspective, imagination is studied by looking at the neural synaptic connections, understood and defined as a mental simulation. (Fesmire, 2010, p.186) The early Western philosophical accounts of imagination often considered it a capacity that is only available to humans. We can trace back Western philosophical accounts of imagination from Plato to Kant's *Critique of Pure Reason*, David Hume and Jean-Paul Sartre's work on imagination, and John Dewey's writings on the matter. Most classical and medieval thinkers considered imagination an unreliable capacity that made things appear deceitfully, beyond their actuality. Plato, for example, gave little importance to the imagination in comparison to other mental faculties.

“Imagination, named alternatively *eikasia* and *phantasia* by Plato and the Greek thinkers, is roundly condemned as a pernicious strategy of simulation: one which tempts mortals to take themselves for omniscient gods, whereas in fact, they are merely playing with reflections in a mirror.” (Kearney, 1998, p.4)

Fesmire (2010) asserts that Plato’s opinions on imagination have been responsible for the low appraisal and interest in imagination, especially among Enlightenment philosophers and psychologists, except from David Hume and Adam Smith. (p.187) Philosophers have disregarded imagination for having a ‘subsidiary role’ in cognitive life. (Fesmire, 2010, p.187) Furthermore, it has been regarded as an insufficient cognitive activity that only allows for a limited ability to conceive the world. “Imagination is vilified as an impoverished mode of perceiving the world, a source of fictitious, fanciful, and erroneous knowledge.” (Bendor, 2018, p.141)

In contrast to the Enlightenment philosophers who have regarded imagination as a limited capacity, some thinkers have viewed imagination as a powerful mental capacity with an intrinsic link to creativity. When viewed hand in hand with creativity, imagination is seen as a capacity of the mind to go beyond the actual realm of possibilities. (Kearney,1998, p.76, Bendor, 2018, p. 141) For instance, for Kant, imagination constitutes a fundamental place in human experience. Kant has mentioned his opinions on imagination by evaluating it as part of human experience besides sense and perception. His views on imagination capture a dual meaning of the concept.

First, Kant explains imagination as the minds’ capability to make images. From this perspective, imagination allows for recognizing “everyday representations of reality” (Wellner, 2018, p.46; Kearney 1988, p.15). Second, Kant refers to the imagination as “art concealed in the depths of the human soul,” thus, he brings forward the artistic facets of imagination. (Wellner, 2018, p. 46) Kant’s opinions on imagination denote a consideration of its creative and productive potential. The productive and creative potential of imagination comes to the fore with imagination’s potential to provide and sustain ideas; hence, it is not only limited as a capacity of image-making. Another common perspective around imagination, linked to the ability of ‘image-making,’ is the role of imagination in making the absent present and present absent. Kearney (1988) refers to this aspect of imagination as “presence-in-absence.” (p.4)

Providing an overview of the experiential aspects of imagination, Bendor (2018) talks about imagination's indeterminacy from a phenomenological perspective. The indeterminacy of imagination can be seen both within the content of the imagination and from the consideration of the imaginative experience itself. Although the experiences around imagination vary, within the process of perceiving, the revived mental images do not always adequately give an exact representation of the thing that has been perceived. Bendor (2018) mentions the research of Alex Osborn (1993), a variety of forms of imagination (p.141), who looks at imagination from two categories. These categories revolve around intentionality and the free-flowing potentiality of imagination. In other words, imagination can be controlled, yet it can also occur as a 'free activity' of the mind.

The free-flowing status of imagination can be exemplified with dreams, hallucinations, perceptual illusions. (Bendor, 2018, p. 141) Indeterminacy of imaginative experiences leads Bendor to consider imaginations' openness to possibilities. However, the indeterminacy of imagination is not always necessarily conceived as a deficiency. While some philosophers such as Sartre devalued imagination as a faulty cognitive capacity, the indeterminate characteristics of imagination can also be thought of as an advantage. Despite its limitations on providing a complete or a concrete image of a thing, an idea, or an object, imagination "can be liberating to the precise extent that it does not restrict or limit what we imagine." (Casey 1976, Bendor, 2018, p. 143) The liberating potential of the imaginative act that Bendor (2018) describes, comes from imagination's capacity to open up new possibilities. (p.143) The possibilities that imagination may offer could guide us into consideration of the artistic and creative, the constitutive role of imagination, which I will come back to later.

Imaginative processes are influenced by our embodied interactions with the social and physical world. (Fesmire, 2010) Imagination is connected with sensations, emotions that shape impressions, and other material from the outer world. At the same time, imagination plays a role in forming the connections between past experiences. Arguing that our past experiences and memories order and shape imagination, Klein, Damm, and Giebler (1983) consider memory as a critical element within the shaping of the imagination, and imaginative experience, as they assert that memory "functions as a store of material for the imagination." (p.17) Looking at the imagination's place in literary theory, they explain the function of imagination in the production of literary works. In addition to imagination, they mention the role of other material and mental, emotive procedures at work in writing. They explain that various mental and

emotive procedures (motivation, energy), memory, and imagination are necessary for literary production. The diversity of other factors, together with imagination, gives us a background on the critical elements that play a part in producing a literary text, which could be expandable to a production process of other kinds of artistic work. However, we should note that different kinds of artistic work might diverge from the literary text in their semiotic system in communication with the audience. (Klein, Damm, Giebeler 1983, p.21)

How does Imagination Travel?

“Imagination is not always a solitary activity – people have the ability to create intersubjective worlds of imagination, to build them collaboratively in interaction with others, and to collectively participate in imagined scenarios. Moreover, individual and collective acts of imagination build new personal and societal resources for imagining and can, through social action, shape the society and culture they draw from.”

(Zittoun, Glăveanu, Hawlina, 2020, p.12)

Imagination is not an isolated individual cognitive activity. When we read that the “Arctic is Melting!” a worrying mental image of a crumbling glacier, maybe a struggling polar bear walking on a thin ice crust comes to mind. The shared familiarity with this image represents how, on a global scale, we hold imaginative representations that shape meanings around a phenomenon such as the climate disaster. In this section, I will contextualize imagination both as an individual and a social phenomenon by reviewing the concept of imagination from a socio-cultural perspective. Studies around the social aspect of imagination guide us into collectively held meanings and understandings of various phenomena shaped by multiple socio-cultural experiences. Collectively shared imaginations are shaped by different types of stories, images, narratives. Here, I am primarily interested in providing an overview of the individual and collective aspects of imagination by considering it in the context of various artistic and cultural experiences. Cultural experiences are defined as “an experience of guided imagination thanks to a specific cultural or artistic artifact.” (Zittoun, Glăveanu, Hawlina, 2020, p.7) Noting that individual experiences are always entangled with social and cultural processes, I will use the term cultural experiences to consider how imagination travels between the individual and the collective.

Zittoun, Glăveanu, Hawlina (2020) assert that the socio-cultural studies of the psychology of imagination explore imagination as a process, as a contextual and dynamic experience that changes over time. (p.4) According to them, psychologists who studied the concept of imagination from a socio-cultural perspective have been interested in the study of the role of imagination in the experience of artworks. The processual study upon audiences' encounter with an artwork shows that the audience draws upon past experiences and memories to make meaning of an artwork. This encounter often occurs reciprocally as the artwork demands certain kinds of attentiveness and an imaginative effort from the audience. The audience's experiences of the artwork are tied to imaginative processes that are "guided, shaped, scaffolded by the specificities of the semiotic guidance of the artifact." (Zittoun, Glăveanu, Hawlina, 2020 p.7) Different past personal experiences then, to put it quite straightforwardly, lead to experience the same artwork differently. The diversity of associations formed between past experiences and memories leads different emotional and imaginative experiences to flourish. The emergence of a new experience from the engagement with an artwork derives from the artwork's ability to guide the audience's imagination.

Furthermore, the cultural, aesthetic experience, guided by the imaginative processes provided by the artwork, or the cultural artifact, can be used as a reference point in the future, since it results in a particular wake of emotion or memory. The potential awakening of certain memories or emotions through the experience of the cultural artifact may be referred back to in certain situations, and further guide another imaginary experience. Professor of sociocultural psychology, Tania Zittoun (2020) refers to drawing upon the memory of an imaginary sphere provided by a cultural experience as 'symbolic resources'. (p.8) She suggests that these 'symbolic resources' can later be transformed into 'materials' to imagine and create further.

Consequently, Zittoun (2020) points out the dynamic state of imagination in the creation and experience of artistic and cultural artifacts. To explain how symbolic resources function as additional material to create other forms of cultural experiences, she gives an example of how reading a story or listening to a song might evoke an emotional response under a specific circumstance and how this emotional experience might be called upon later within a different creative, imaginative context. The mentioned flow of creative outputs generated by imaginative processes, which are facilitated by cultural experiences, point out how "imagination can feed into an expansion of our collective experience." (Zittoun, Gillespie, 2016 p.18)

Social theories of imagination and the perspectives provided by socio-cultural psychology on imagination explore imagination as a social and a cultural phenomenon. Social anthropologist Arjun Appadurai (2000) in his widely acknowledged essay on globalization, “Grassroots Globalization and the Research Imagination,” highlights the social aspect of imagination:

“The imagination is no longer a matter of individual genius, escapism from ordinary life, or just a dimension of aesthetics. It is a faculty that informs the daily lives of ordinary people in myriad ways: It allows people to consider migration, resist state violence, seek social redress, and design new forms of civic association and collaboration, often across national boundaries.” (Appadurai, 2000, p.6)

Appadurai (2000) recognizes imagination as a social force as he explains how modern citizens are controlled and disciplined based on the interests of social institutions through imagination. However, he also notes that imagination is also a faculty that allows for the emergence of new collective patterns and arrangements that give rise to creative forms of social life. (p.6) Appadurai’s ideas on imagination support its shifting status between individual and social realms. If we consider the studies around the imaginaries² from a socio-cultural perspective, it is possible to determine two entangled modes of analysis. While the individual psychological analysis on imagination focuses on its experiential aspects, its role in individual creativity, meaning-making, and perception; broader socio-cultural questionings around imagination focus on the collective and cultural understandings and experiences generated by imaginative processes.

A similar realization has also been noted by the professor of design theory, Mads Nygaard Folkmann. Folkmann (2014) considers the studies that concern the social analysis around imagination operating from macro and the micro-levels. He asserts that on a macro level, the studies of imagination within the realm of social and cultural theory, explore imagination as a component of culture, a part of socially shared system of signs and meanings.

² Critics of the theories of imagination have found that imagination theories have failed in capturing the intrinsically social dimension of imagination. As a relatively new term derived from the substantivized adjective of imagination, the concept of the imaginary underlines how humans are always born within particular imaginary significations and that, on a social level, humans depend on socially recognized imaginary significations. (Bottici, 2019, p.434)

On a micro level, he asserts that the studies of imagination focus on the role of imagination in creating “structures and figurations of meaning.” (Folkmann, 2014, p.7) Folkmann refers to the writings of the sociologist Peter Murphy who studies imagination as part of the creative component of culture. Murphy (2009), confirming the social functioning of imagination, further suggests that, more than a psychological capacity, “imagination is also a collective, social, economic, and a historical capacity.” (p.6)

For many years, sociologists and ethnographers have studied how societies are held together by looking at the commonly shared understandings of how social life functions. Social and collective forms of imaginaries have been a particular point of focus of these studies. Charles Taylor’s (2004) study of social imaginaries has been one of the most referred works on social imaginaries in the context of modernity. Taylor’s analysis was focused on explaining Western modernity with the consideration of economic, political, and religious transformations from a perspective of social imaginaries. His study on social imaginaries in the context of modernity aimed at “addressing grand patterns of political and historical thought.” (Jasanoff, 2015, p. 7) In addition to their functioning within big-scale social processes, STS scholar Sheila Jasanoff in her *Dreamscapes of Modernity* indicates that imaginaries also function on smaller scales. While acknowledging imagination as a social capacity, her conceptualization of imagination focuses on the social conceptions around science and technology. Jasonoff’s (2015) work addresses the socio-technical imaginaries as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology.” (p.4)

Jasanoff’s (2015) conceptualization of collective socio-technical imaginaries points out the performative aspect of technoscientific developments by exemplifying how, throughout history, governments and the ruling class promoted new technological developments to entertain the public’s attention. In her research, she hints at how specific cultural experiences such as science fiction stories might create and shape collective understandings around certain social phenomena.³ These experiences, offered by certain cultural artifacts, might take place in

³ Jasanoff in *Dreamscapes of Modernity* is particularly concerned with how social actors ranging from governments, nation-states to advertising companies, big corporations and engineers perform and co-produce visions for the futures of technoscientific developments. She studies these visions through the term sociotechnical imaginaries.

shaping collective visions of the future. For Jasanoff (2015), science fiction can be considered a repository for technological innovations. (p.337) She explains how sci-fi scenarios cultivate specific ways of thinking and imaginings about possible futures, and how these scenarios often make their ways into collective imaginaries.

“Science fiction stories express fears and yearnings that are rooted in current discontents, either signaling possible escape routes or painting in morbid colors the horrific consequences of heedlessness in the present. They thus offer a deeper look into-possibly even predictions of-what harms societies are most desperate to avoid and what good they may achieve through foresight and imagination.” (Jasanoff, 2015, p.337)

As collective imaginaries can guide us into particular expectations from the future, cultural artifacts, such as science fiction stories, can be considered significant driving forces behind fueling future visions and spreading certain beliefs and understandings about socio-technical developments. Aside from science fiction, various forms of media and popular culture shape imaginaries and confront us with certain representations of the common social beliefs around certain social phenomena by giving insights into certain social structures, common norms and narratives, socially accepted behaviors.

What more can imagination and collective imaginaries offer besides providing particular insights to explore specific characteristics and dynamics of social life? Imaginaries, traveling in between the individual and collective levels of meaning-making, may also create new collective narratives for the future. Therefore, imaginaries are considered political. In this regard, we can look at Shelia Jasanoff’s (2015) example from a commentary on the British science fiction television show *Doctor Who*. In her example, Jasanoff refers to columnist Laura Penney’s review on the show who criticizes the show for persistently choosing white male actors to play the lead roles. Jasanoff quotes from Penney, “Sweeping social change usually happens in stories first, and science fiction often has an agenda. What could be more political, after all, than imagining the future?, Indeed!” (p.338) As politics continuously enact upon and speak to social imaginaries, Jasanoff accepts that imagining the future is a political undertaking. She explains that the political lives of societies are a form of storytelling, and that societies are constituted of joint and multiple imaginaries. In addition to this point, it is important to note that imaginaries are difficult to determine as they are not fixed. Accordingly, Jasanoff notes

ascribing imaginaries a fixed ontological value, would be problematic to work with. (Jasanoff, 2015, p.339)

Situating Alternatives

So far, I have provided an outlook on imagination by looking at how it has been conceptualized by covering research within STS, cultural studies, sociocultural psychology, and philosophy. From a sociocultural perspective, I have discussed how the study of imagination gives insights into socially held beliefs and meanings. Furthermore, I have touched upon the creative aspects of imagination in production and the experience of cultural artifacts, and I mentioned how sociocultural studies on imagination give insights into shared social beliefs and social values, collective thoughts, and expectations about the future. Referring to Jasanoff's (2015) study on socio-technical imaginaries, I pointed at how future imaginations can find their ways into reality by referring to her insights on the close link between technoscientific developments and science fiction narratives (hinting at the close relationship between imagination, fiction, and reality).

Social imaginaries are multiple and overlapping, contradictory, and coexistent. (Haiven, Khasnabish 2014, p.4) As previously mentioned, imaginaries are not easy to determine. Nevertheless, it might still be possible to recognize some prominent and recurring visionaries bearing in mind the current sociopolitical, technological, planetary conditions. Drawing on this line of thinking, if we consider contemporary popular culture, films, and media, what kinds of depictions or future imaginaries might we encounter?

As introduced at the beginning of this chapter, the growing impacts of climate changes, extinction of the species, and ecological destructions, and the impacts of centuries of industrialization have placed humans as the driving force behind the big scale planetary changes in the planetary epoch referred as the Anthropocene. The impacts of anthropogenic climate changes have reached the extent that it presents a growing threat to life on earth. As a result, the fears and concerns around the future of the planet can be observed from the imaginaries represented within popular culture, marked with the fantasies around apocalypse and world-ending doomsday scenarios. Collectively held visions of catastrophic futures, the fears around

destructive technologies are a haunting manifestation of a state of melancholia and fear caused by a legitimate concern for the future.

Other than being considered as a repository of collective forms of social imaginaries, science fiction scenarios are described as “fabulations of social worlds both utopic and dystopic.” (Jasanoff, 2014 p.1). STS scholar and anthropologist Danya Glabau (2019) observes that within the mainstream scripts of sci-fi, depictions of technological advancements are often portrayed in line with dystopian futures. (para.4) She gives examples of contemporary mainstream science fiction shows such as *Black Mirror*, *Westworld* to exemplify her suggestion of the prevalent dystopian visions of technological futures. According to Glabau (2019), these shows “perpetuate the idea that humans are greedy and violent, and the technologies they will produce will be equally hegemonizing and evil.” (para.3) The dystopian depiction of digital technologies within these shows based on the harmful consequences of surveilling people and extracting resources from the earth is a fearful vision that is not so unfamiliar to our global cybernetic capitalism.

As most giant technology companies today are monopolies that engage in multiple forms of extractivism, the fearful consequences around exploitative technologies depicted within sci-fi scenarios are not entirely irrelevant to the realities of our contemporary technoculture. With the large scale extraction of information that the companies collect from the technology users for the sake of making more profits, as well as the extraction of the resources from the land, looking at the current state of the world scorched by the modes of governances driven by the principles of techno-capitalism, it is not difficult to be caught up in a mode of cynicism or defeatism. However, as Glabau points out, scholars, artists, and designers within recent years have been increasingly interested in exploring how imaginative and fictional worlds might offer more than only disappointing future scenarios. Glabau (2019) asserts:

“In fictional worlds, we can control technology again. While science fiction has provided the scripts that many technologists have used to create our disappointing future, it also plays an important epistemological role in the struggle against racism, sexism, ableism, classism, xenophobia, and capitalism. It invites us to consider that the ways societies are organized in the here and now are themselves contingent fictions.” (para.2)

Storytelling and fiction are undertaken as tools for discovering the possibilities of giving shape to alternative worldviews, especially within the future-oriented approaches of social sciences and humanities, arts and design practices. Anthropologists have started to look into the intersections of speculative fiction and anthropology. In “Introduction: Speculative Anthropologies,” the authors pose the following question, “how do the imaginative practices of speculative fiction allow us to propose alternative fields of engagement with the stories we tell and the materials we use to tell them, as well as opportunities to reconcile a tragic past and present with a hopeful future?” (Anderson, Backe, Nelms, Reddy, Trombley, 2018, para.1)

On the other hand, design fiction and speculative design approaches attract more and more attention within the field of design in line with the current interest in creating new kinds of imaginaries for the future. For instance, *Speculative Everything* by Dunne and Raby (2013) became one of the leading books in the field of speculative design. Inspired by science fiction, in the book, the authors have attempted to explain how as a branch of design, speculative design might help imagine different futures. (Dunne, Raby, 2013)

Both speculative design and the closely related field critical design aim to raise questions about the impact of designed objects in our life based on the observations and insights gathered from everyday interactions with technologies. Dunne and Ruby (2013) has positioned speculative design practice in close relation to future-oriented fields of “futurology, speculative culture including literature and cinema, fine art, and radical social science.” (p.3) In their book, Dunne and Ruby (2013) aim to position their approach to design practice outside of the production led motives of industrial, market-driven design. Market-driven motives within the design field are aligned with Silicon Valley ambitions and corporate traditions that increasingly place design in line with new technological innovations. Within the book, Dunne and Ruby (2013) offer several motivations and definitions of speculative design. They explain their interests as to explore possible futures and to use “them as tools to better understand the present and to discuss the kind of future people want, and, of course, ones people do not want.” (2013, p.2)

Dunne and Ruby (2013) aim to separate speculative design practice from industrial production through encouraging designers to work more independent from industry, working collaboratively “with curators and other professionals, independently of industry, in partnership with organizations focused on society in the broadest sense, not just business.” (Dunne, Ruby,

2013, p.1) However, without going deeper into the criticism of the foundation of design and technological-industrial complex, their suggestion might remain at the surface level for drawing a path outside of the industry. In relation to this, Dunne and Ruby's approach to speculative design has been criticized for having a distant attitude in engaging with social issues within their design approach. Furthermore, their approach has also been problematized for maintaining a privileged view in design practice and enforcing an elitist perspective on technologies. (de. O. Martins, 2014).

In the continuation of such criticisms, there has been efforts from designers and researchers to address the fundamental problems around speculative design's lack of interest in social issues. These efforts have aimed to start a more in-depth and critical inquiry on the design field's racist and patriarchal foundations. Such investigations can be seen from the works of researchers and designers such as Luiza Prado de O. Martins (2014). In her work, Prado de O. Martins explains her intentions as developing a more intersectional, feminist approach to speculative design and design fiction. These concerns within the design field beg for a broader questioning of the kinds of 'alternative' future imaginings cultivated by different social actors and institutions.

As Jasanoff's (2015) study on the performative aspect of science and technology shows, through the "imaginative work" of social actors and institutions, nation-states and governments perform and produce their particular future visions of the collective good. (p.11) The multiplicity and ambiguity of imaginaries complicate the quest for 'alternative' imaginations for the future or alternative visions for a 'better' future; promises that seem to appear more frequently within art and museum discourse, and beyond as can be seen within diverse government and corporate narratives. Artist, designer, and researcher Alexandra Daisy Ginsberg realizes this situation as she notes: "Advertisements, propaganda, policies, visions, and utopias are crafted by copywriters, politicians, designers—and even scientists—all promising us a better future." (2013) In her PhD Project *Better*, she considers who imagines futures, under what circumstances 'better' futures are claimed to be imagined, and for whom⁴.

⁴ She adds "better is not a universal good or a verified measure; it is imbued with politics and values. And better will not be delivered equally, if at all." (Ginsberg, 2013)

With multiple heterogeneous actors engaging in futures through their intellectual and practical strategies, the future has become problematic. (Savransky et al., 2017, p.2) Most approaches to the future maintain with the business-as-usual approach while avoiding engaging the problematics embedded within the present. The Anthropocene discourse, according to Donna Haraway, maintains these problematics by pursuing the descriptions of ‘humanity’ as the great force of nature.

“The Anthropocene discourse delivers a Promethean self-portrait: an ingenious if unruly species, distinguishing itself from the background of merely living life, rising so as to earn itself a separate name (anthropos meaning “man,” and always implying “not-animal”)” (Haraway, 2016, p.16)

Haraway’s suggestion for going beyond the human-centric views of the Anthropocene, has been supported with her inquiries on the problematics of the nature-culture divide. As Arturo Escobar (2018) notes in *Designs for the Pluriverse*, the deconstruction of the nature-culture divide, which started in the 1980s, through the works of authors such as Bruno Latour, Philippe Descola, Tim Ingold, Marilyn Strathern, and Donna Haraway, nowadays is focused on reconnecting nature and culture, human and nonhumans. This commitment is observed in feminist scholarship with the creative efforts to explore “other ways of worlding”, (Escobar, 2018, p.65) as can be seen with the practices of *feminist SF*.

Feminist Storytelling, Imagination and SF

Within the future-oriented interests of arts, humanities, social sciences, works of feminist writers have provided new ways to think about the future through science fiction, storytelling, and speculative fiction. For a long while, feminist SF writers such as Ursula Le Guin, Octavia Butler, Donna Haraway incorporated imagination into their works to create other worlds, speculate on futures. Feminist fiction confronted gender inequalities and racial bias by providing alternative epistemologies. Based on such efforts of feminist writers, imagination has been seen and encouraged as a form of feminist knowledge production. (Grusin, 2017, p.11) Feminist science fiction writers encourage thinking about sociocultural and ecological entanglements and the futures of technoscientific culture through imagination and fiction.

Feminist SF writers foster critical thinking around the commonly held cultural assumptions around technoscientific progress by speculating about possible, utopian, or dystopian futures. In this section, I will introduce some of Donna Haraway's central ideas around the practices of feminist SF. Donna Haraway's work is frequently mentioned in research concerning futures, as her academic work combines storytelling with imagination and science fiction. To reminiscence Haraway's famous quote from her most recent book *Staying with Trouble, Making Kin in the Chthulucene*:

"It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories." (Haraway, 2016, p.12)

SF constitutes an essential part of the narrative in *Staying with the Trouble*, and the ideas introduced in the book as we shall see. Haraway's approach to storytelling has had a considerable impact on the futures discourse. Feminist SF does not only refer to the genre of science fiction. In fact, feminist SF is a quite mixed-up category. (Anderson, Backe, Nelms, Reddy, Trombley, 2018, para.1) Inspired by British social anthropologist Marilyn Strathern's work, Haraway introduces her SF acronym, which stands for "feminist speculative fiction, science fiction, string figures, so far." (2013) For Haraway (2016), the practices around SF are activated with the urgency and importance of different modes of thinking, imagining, and acting that is urgent in the Anthropocene. (p.7) A goal behind thinking through the intersections provided by the practices of feminist SF, is to question and explore possibilities for a collective flourishing in the future.

Haraway (2013) refers to the writings that inspire her in pursuing the practices of feminist SF as "multi-form worlding practices." (p.2) She has often indicated in her writings that engagement in SF is a collaborative practice. Like playing the game of string figures (SF), each part of crafting worlds connects to the experience and thinking of another being. Haraway's metaphor of playing string figures illustrates how the collaborative storytelling practices of feminist SF takes place. Her depiction of the collaborative endeavor of playing string figures signalizes how she pictures multispecies storytelling as a collective work of 'worlding' practice. According to Haraway, 'worldling' practices tell "big-enough" stories that acknowledge our entanglements with non-humans. (Haraway, 2016 p.52; Westerlaken, 2020, p.87)

In her writings, Haraway is often critical of the concept of the Anthropocene; she proposes to use the terms *Capitolocene* or *Chthulucene* instead.⁵ She argues that the Anthropocene does not cover the actual reason behind the mass extinction events, as it considers the climate changes as a species act. The term *Capitolocene*, she asserts is perhaps a better suited way explain the reasons behind the mass-scale extinctions and climate changes, since it gives more attention to the historical, sociopolitical dimensions of the big-scale planetary consequences that we are facing currently. Haraway (2015) asserts:

"Watch what's going on in the Arctic as the sea ice melts and the nations line up their war and mining ships for the extraction of the last calorie of carbon-based fuels from under the northern oceans. To call it the Anthropocene misses all of that; it treats it as if it's a species act. Well, it isn't a species act. So, if I had to have a single word, I would call it the Capitalocene." (p. 259)

As an alternative to the concept of the Anthropocene, Haraway introduces *Chthulucene* neologism to encourage a rethinking of how different modes of life matter, species-wise and among human societies. (Glabau, 2017, p. 542) Rather than being caught up in Anthropocene's 'prick tales⁶,' Haraway suggests that *Chthulucene* invites us to think because rather than depicting an end to time, *Chthulucene* indicates an 'ongoing presence of being.' With *Chthulucene*, Haraway points out the man-made narratives through the notion of prick tales, which echoes throughout the earth's history. The term *Chthulucene* draws on H.P. Lovecraft's fictional character *Chtulhu*. *Chtulhu* is a misogynist nightmare monster, but Haraway (2016) "rescues" *Chtulhu* (with a spelling difference) from Lovecraft's patriarchal mode as she posits it in opposition to the cynical discourse of the Anthropocene. (p.174) This idea informs Haraway's understanding of the mixed-practices of feminist SF, as I shall delve more into later in the second chapter.

⁵ Haraway acknowledges that the term Anthropocene offers a helpful framework for most, in order to think about how the human activity had an influence on the planet.

⁶ 'Prick tales' is Haraway's term for referring to Man-made narratives. In *Staying with the Trouble*, she specifies that this tale is a tragic one with a determined actor. It is written from a restricted, human-centric, white, male perspective. "In a tragic story with only one real actor, one real world-maker, the hero, this is the Man-making tale of the hunter on a quest to kill and bring back the terrible bounty." (2016, p.39)

"—to think—outside the prick tale of Humans in History, when the knowledge of how to murder each other—and along with each other, uncountable multitudes of the living earth—is not scarce. Think we must; we must think. That means, simply, we must change the story; the story must change." (Haraway, 2016, p.40)

In *Staying with the Trouble*, she advises thinking about how to go beyond a language of apocalypse prevalent in the Anthropocene discourse since it paralyzes us with fear, and instead, she invites us to continue to 'stay with the trouble.'

'Sympoiesis', contrary to autopoiesis- which explains a system's ability to contain itself-, is a keyword for multispecies kin-making for Haraway. Haraway describes sympoiesis as making-with. Through sympoiesis, Haraway is able to explain how biological systems function in a collective, generative manner. Even though she does not refer to Deleuze and Guattari's writings, she also uses the concept of 'assemblage' to capture the multiplicity of relations and symbiotic arrangements within ecologies. The concept allows us to imagine the collectivity of biological, a human, non-human, a togetherness that Haraway refers to as 'ecological assemblages.' Haraway's proposal for a multispecies becoming-with acknowledges assemblages and 'technological couplings' crossing paths with more-than-human worlds, as she writes, "It is no longer news, that corporations, farms, clinics, labs, homes, sciences, technologies, and multispecies lives are entangled in multiscalar, multitemporal, multimaterial worlding." (Haraway, 2016 p. 115)

In the last chapter of *Staying with the Trouble*, Haraway (2016) exemplifies the idea of imagining multispecies flourishing through an unfinished attempt of a speculative fabulation called "Camille Stories: Children of Compost." Within this speculative fabulation exercise, Haraway's ideas around kinship and kin-making come to the fore, as she asserts: "Make kin, not babies!" Glabau (2017) notes that Haraway's call should not be understood as a wish to prevent new generations of human lives. (p.542). Instead, she explains that Haraway wants the reader to prioritize thinking about how the forms of relationships we build in social life sustain power relations and hierarchies between humans and non-humans.

"Camille Stories," thinks becoming-with others, the story of genetic hybrids of humans with other species. The speculative fiction exercise presents Donna Haraway's ideas on how human and non-human companions might work together through building networks, webs,

pathways for a 'newly habitable world.' (Haraway, 2016, p.137) Within “Camille Stories”, Haraway does not merely ignore the troubles that Anthropocene presents with us. Yet, by imagining a possibility of multispecies collaborations, Haraway aims to stimulate thinking about other options for "living in a damaged planet." (p.37)

Donna Haraway's attitude towards the uncertain future of the planet can be best described with an attitude of care. In Haraway's terms, her caring attitude could be regarded as a 'response-ability,' following her other companion feminist writers such as Anna Tsing. In addition to the unfruitful defeatism embedded within the Anthropocene discourse, Tsing and Haraway encourage thinking about "how to live and die well with each other in a thick present." (Haraway, 2016 p.1) The thickness of the present moment comes from the painful histories of the past. Hence, Haraway acknowledges the difficulties and challenges, painful realities of the past reflected within the present moment. This way of thinking informs her understanding of *ongoingness*, embraced and encouraged by creative feminist SF practices.

As we have seen so far, Haraway's vision of multispecies storytelling strives to find possibilities for a collective flourishing. In *Staying with the Trouble*, she uses the term ‘worldling’ together with multispecies, and the neologism of ‘sympoiesis’ to indicate making-together-with. Haraway's views on feminist SF practices encompass the generative, creative, and social-cultural functioning of imagination by undertaking artistic practices, storytelling and science fiction as a cultural material and mediator. Another and perhaps a more obscure reason behind the utilization of imagination and fiction within SF's practices is perhaps their role in facilitating relating to the (nonhuman) Other. Through SF, Haraway's writings explore ways of relating to non-humans to challenge human exceptional modes of thinking based on human exceptionalism, as exemplified with her speculative fabulation exercises. Relating to the Other is a fundamental step for going beyond the ideas that stem from the divisions made between nature and culture, human and non-human, and reorganizing interspecies relations, which presents an ongoing challenge.

Imagination and Relating to the (Nonhuman) Other

At the beginning of this chapter, I have focused on the experiential and sociocultural aspects of imagination; I have touched upon the relationship of imagination with memory and

perception. Here, I will take this inquiry further and bring an additional dimension to the sociocultural analysis of imagination by including its relational aspect, which builds traffic between the individual, social and ecological through the cultural mediators of artistic and scientific practices. I aim to point out how this aspect of relationality might function in creating and experiencing artistic and scientific processes that explore relationships with the (nonhuman) Other. Storytelling and imagination here acquire an essential role with their integral part within expanding the perception to recognize the Other, or processes that lead to othering, by cultivating empathy. Looking at the role of imagination in realizing the relationships with the (nonhuman) others, I aim to exemplify what this realization might contribute to our understanding of the practices of feminist SF and artistic and scientific approaches that focus on study of the entanglements between humans and nonhumans.

As I have introduced in the previous section, some of the core ideas associated with Haraway's conceptualization of feminist SF practices are focused on the realization of ecological assemblages and interspecies relations. Interconnectedness, a central notion to ecology, highlights how "all living, human or not, takes place within a relational matrix." (Escobar, 2013, p.12). Attending to these relationalities are crucial parts of the games of feminist SF and its creative endeavors that are based on simulating imagination. Relating to other forms of beings, or the capacity to place oneself in another's position, is an empathetic attempt. Nicole Seymour (2013), in *Queer Ecologies*, asserts that "empathy is by definition a largely imaginative act" (p.12), as she implies the central role of imagination in relating to other forms of subjectivities. (e.g., in empathizing and relating with the human and nonhuman other)

Storytelling practices under feminist SF, awake imagination to challenge normative values. For instance, Ursula Le Guin's novels, such as *Left Hand Darkness*, have introduced characters under alternative sex-role stereotypes. After the publication of Le Guin's book in 1969, more feminist writers have started to work with the concept of androgyny, especially within the science fiction genre. (Annas, 1978 p.146) From the 60's onwards, feminist SF writers have challenged the political conservativeness of the science fiction genre. (Annas, 1978, p.144) Storytelling was incorporated by feminists as a means to looking through the eyes of the other. In addition to the cultivation of empathy, we can suggest that thought processes supported by imaginative experiences might help going beyond binary, linear thinking towards a more relational understanding of the world. Haraway's term *tentacular thinking* may help in picturing the relational workings of imagining the interlaced trails of being.

Tentacle is a term from zoology. It describes flexible limbs, appendages, sense organs in animals. “The tentacular are not disembodied figures; they are cnidarians, spiders, fingery beings like humans and raccoons, squid, jellyfish, neural extravaganzas, fibrous entities, flagellated beings, myofibril braids, matted and felted microbial and fungal tangles, probing creepers, swelling roots, reaching and climbing tendrilled ones.” (Haraway, 2016) Tentacular thinking binds stories together, as it incorporates thinking like the other: nonhuman, mythic, imaginative, the octopus, *Medusa*, *Cthulhu*. It presents a metaphor for multiple forms of networked existence.

Metaphors have an essential place in giving shape to our ecological, relational understandings. Metaphors in ecology describe connections and relationalities that evoke imaginative simulations. These ‘imaginative simulations’, shaped in part by metaphors, support our observations and understandings of complex systems. (Fesmire, 2013,p.198) Metaphors in ecologies can be exemplified by webs, networks, communities, all of which imply a form of relationality. These relationalities within diverse ecosystems are studied by biologists when they study the interactions of organisms, the communities, and their environments. We rely on a source of metaphors around ecosystems used by biologists to describe certain kinds of relations that work on an imaginary level when we think about our connections within a broader web of relations. ‘Imaginative simulations’ are activated through various metaphors in language, supported with images and narratives, which play a supportive role in understanding relations within ecosystems, complex systems, and entanglements.

Examples from the studies of scientists who study biodiversity and ecological relationships might indicate how imaginative simulations support the understandings of complex systems. “To think about the intricate interrelationships among the components in an ecosystem, one must be able to imagine them.” (Seymour, 2013, p.12) Scientists depend on imagination to understand the ecosystems they study, even sensuous knowledge and imagination is regarded as mere speculation and devalued in some scientific circles. To make findings and understandings of the study more vivid, imagination is required, as “science isn’t an exercise in cold-blooded rationality.” (Sheldrake, 2020 p.43). The writer of the *Entangled Life*, biologist Merlin Sheldrake (2020), studies fungi, their relationships with their environments, and the networks fungi forms. He explains how his research has led him to a continuous sampling process, staring into microscopes looking at ‘rootscapes’ to understand the complicated behaviors of fungi.

“Microbial lives, especially those buried in soil, were not accessible like the bristling charismatic aboveground world of the large. Really, to make my findings vivid, to allow them to build and contribute to a general understanding, imagination was required. There was no way around it.” (Sheldrake, 2020 p. 42)

In the book, Sheldrake noted how imaginative processes supported his empirical studies of different kinds of fungi. For his PhD research, Sheldrake was invited to Panama to study mycorrhizal relationships⁷ in tropical forests. Dazzled by the diversity of life within the tropical forest, Sheldrake finds the study of fungi inspirational for exploring how humans might form distinct relationships with their surroundings and interpret life. *Entangled Life* exemplifies the current academic and artistic fascination around the study of fungi. Forms of symbiotic relationships that fungi establish with plants and their environments inspire imagination-driven speculative, artistic practices.



Figure 1. Imagining a *Living Infrastructure* by Martina Huynh (2018)

⁷ Mycorrhizal networks are underground hyphal networks created by mycorrhizal fungi. These networks connect individual plants together. Through these associations water, carbon, nitrogen, and other kinds of nutrients and minerals are transferred.

For instance, speculative design project *Living Infrastructure* (2018) by designer Martina Huynh is inspired by the mycorrhizal networks that fungi form with their environments. Huynh reimagines conventional network infrastructures such as electricity and internet cables, experimenting with fungi's specific transmission characteristics. As the cable infrastructures are reimagined with their resemblances of fungi networks, Huynh proposes other possibilities for existing technologies of infrastructure. Rethinking and exploring possible connections with fungi involves considering the complex and evolving networks that fungi form between plant roots. The project aims to explore different living modalities and the surrounding ecologies by examining how fungi form symbiotic relationships with their surroundings. According to Huynh, these relationships observed within the behaviors of the fungi may lead to imagining for how humans may lead different ways of relating their surroundings and to other species. Although the applicability of the project is questionable on a large scale, the project presents a compelling example of how the multitude of the types of relationships other species form within their environments. It further makes us think about how the insights discovered from the lives of other species might lead us to find other ways of living. Huynh's project demonstrates this idea, by reconsidering the material arrangements of our socioecological, technological networks, inspired by the behavior of fungi.

The Cyborg: A Turning Point for Feminist Imagination and Feminist Technoscience

Haraway's approach to the question of "how to live in a damaged planet" (2016, p. 37) involves imagining and making-together of human and nonhuman entities, including her image of the cyborg. Donna Haraway's *A Cyborg Manifesto* (1985) is a timeless piece that still helps us imagine and reflect on technological transformations. Glabau (2017) notes that the cyborg is an invitation for new political sensibilities since it is also a request for relating the Other- the machine, the animal, the disabled, or the historically oppressed. (para. 13) In her writings, Haraway often refers back to cyborg as part of her call for earthly survival.

In *Staying with the Trouble*, Haraway (2016) asserts: "Cyborgs are kin, whelped in the litter of post-World War II information technologies and globalized digital bodies, politics, and cultures of human and not-human sorts." (p. 104) The genderless figure of the cyborg has highlighted the importance of feminist theory in unpacking the politics of the relations between the human-animal, human, and the machine. Although a controversial figure, with the figure of

cyborg Haraway, was able to capture the tensions stemming from the long made distinctions between the natural-artificial, mind-body; the distinctions that apply to the conceptual differences perceived between organisms and machines, using it as a figure for ‘killing’ of the dichotomies.

In *A Cyborg Manifesto*, she refers to cyborg as an ‘imaginative resource and a material reality.’ (Haraway, 198, p.7) As a genderless, machine-human hybrid, Haraway’s cyborg depicts how effectively she uses imagination in her thinking and writings on technoscience. In the next chapter, I will point out how the use of the concept of the cyborg has marked an alternative trajectory for feminist movements, for the theories of feminist technoscience. I will further investigate how the cyborg revives the collective imagination and reflects some of the core ideas that I want to focus on within the context of the mixed practices of feminist SF. But here, I will first look at the origins of the term cyborg and give some historical background on the cyborg figure’s development in order to trace Haraway’s intentions behind utilizing the concept of the cyborg.

The concept of the cyborg has strong ties with the history of space exploration. Starting from the 60’s cyborg has been part of the research that has been interested in applying cybernetics to space flights and exploration. During the Cold War period, when the space race was heated in 1960, Manfred Clynes, a scientist in *Rockland State Hospital* in New York, has represented his paper about a ‘space medicine’ at a military conference. (Kline, 2009, p. 332) Manfred Clynes and Nathan S. Kline used the term cyborg as co-authors of the paper. The cybernetic organism referred to as the cyborg in the article was a mouse. In their experiments, the scientists have injected the ‘space medicine’ into the mouse’s body. The medicine was intended to be developed for the usage of astronauts in space missions.

The cybernetic feedback mechanism was generated between the mouse’s body and the scientists who have implanted a pump mechanism on the mouse and controlled the rate of the pump of the injector. Clynes and Kline (1960), upon their research on the cyborg concept, proposed that with space medicine, the human body would potentially be able to withstand the longevity of the duration of space flights. In a sense, the researchers intended to turn astronauts into cybernetically extended organisms, cyborgs. The drugs aimed to reduce and control the astronauts’ physiological reaction to the space environment’s challenging conditions. Space medicine would finally “ironically free humans from their machines, from all the equipment

needed to create an earth-like environment in space.” (Kline, 2009, p. 340). Sometime after presenting the research paper on space medicine, NASA has pursued an interest in the ‘cyborg technique.’

When Donna Haraway wrote *A Cyborg Manifesto* in 1985, she was undoubtedly aware of the concept of the cyborg and its roots, which goes back to the Cold War space race and military space exploration. In a short film by the open-media collective *Paper Tiger Television* called ‘*The National Geographic*’ on *Primates*, Donna Haraway unpacks representations of nature-culture dualisms engrained in the modern documentations of science and nature, focusing on the case of ‘cultured’ gorilla Koko. Towards the end of the short film, we see a video clip of the opening scene from Stanley Kubrick’s *2001: A Space Odyssey*. As the bone is thrown into the air by the ape and transforms into the satellite imagery in space, Haraway mentions the long-standing boundaries between the organism and the machine. She then asserts: “What we all became when we move into space is cyborgs.” Haraway proceeds to take off her vest to display the t-shirt she is wearing, and we see a picture of the Earth, *The Blue Marble*.

The Blue Marble, the image on Haraway’s shirt, is the first picture of the Earth taken from space. As Haraway explains, the picture has become a symbol for the environmental movements in the 80s. The story of the first world picture and its ties to the environmental movements is worth mentioning before going back to Haraway’s depiction of when humans became cyborgs.

The editor of the *Whole Earth Catalog*, Stewart Brand was the name behind the public campaign that promoted the first earth picture taken from space. The catalog was so diverse in its topic of interest that it was considered as an early prototype of the internet. The diverse range of topics included content from computational physics to gardening tools. With its ties to the hippy movement, the catalog was also widely associated with DIY, digital counterculture movements. Stewart Brand was highly motivated to have the world’s first photograph taken. He believed that if humans could see the Earth as a whole, they would act more consciously and caringly, seeing their ‘home’ from outside. He was so dedicated to his mission that he even collaborated with architect and system theorist Buckminster Fuller and the media theorist Marshall Mc Luhan to make his dream of the world picture come true. The two scholars have supported Brand’s idea. Referring to the *Apollo 8* space mission, Marshall McLuhan, in 1974,

talked about how the *Sputnik* created “a new environment for the planet.” (1974, p. 49). According to Brand, Fuller, and McLuhan, viewing the Earth outside from space would be the source of the beginning of widespread ecological thought.⁸

Going back to the film and Haraway’s statement on when we became cyborgs, Haraway directs our attention to *The Blue Marble*. Printed on Haraway’s t-shirt, the underneath slogan reads: “Love your Mother!” Haraway explains how the Earth’s picture is a representation of the space race during the Cold War. However, the same image of earth was also appropriated for the anti-nuclear ecology movements. Haraway explains how the origins of the picture, linked to the Cold-War space race, have deep connections to Western desire to possess the land. In doing so, Haraway point outs an irony in using the earth image for anti-nuclear movements with the ties of space exploration to the military. Haraway’s ‘ironic’ figure of the cyborg was born during this time, and it has been a controversial figuration because of its strong ties with the military-industrial complex.

The cyborg figure was found inimical to environmental movements because of its mentioned link to the military-industrial complex. However, Haraway’s cyborg, ‘a condensed image of imagination and reality’ works together with the ironies and possible dangers of new technological developments. Haraway has inspired the early techno-utopian perspectives around new technologies with the cyborg and was widely criticized for fetishizing technologies by different feminist groups, including the environmental feminists. Still, Haraway’s intention was not to radically oppose the objectives of environmental movements or environmental feminists. At the end of *A Cyborg Manifesto*, Haraway does not strictly stand in opposition to the goddess image of the Earth that ecofeminists provide. Although she asserts, “I would rather be a cyborg than a goddess!,” she also has noted that “both are bound in the spiral dance.” (Haraway, 1985, p. 68)

⁸ The image of *The Blue Marble* (1972) has assisted Mc Luhan’s idea of the global village. According to this idea, the expansion and globalization of the web of mass media technologies would make the world more interconnected. In relation to this, Mc Luhan noted that the launch of *Sputnik* in 1957 by the Soviet Union, “created a new environment for the planet, for the first time the natural world was completely enclosed in a man-made container.” (Hui, 2020, p.57) Launch of the satellite has marked the first time when humans got to be able to view earth from outside in space, through satellite technology. The launch has also triggered the Sputnik Crisis and started the Space race, as part of the Cold War.

A large number of feminists, scholars from various disciplines have approached the cyborg figuration within different contexts, from their different perspectives. Alaimo (1994) described the manifesto as a celebration of “feminist possibilities of embracing technology by blurring the human/ machine bound.” (p. 146) In her 1994 essay, Stacy Alaimo has provided a critical reading of the cyborg figure compared to the environmental feminist perspectives. She suggested that an alliance might be formed between the two views while pointing out both shortcomings of cyborg and environmental feminists’ feminizing, victimizing opinions on women and nature. According to her, while the “ecofeminist glorifications of the ‘nature’ plays into the hands of the capitalists, cyborgs forsake a destructive kind of technophilia.” (Alaimo, 1994, p. 133) Despite the controversies the cyborg has embodied, it has been a widely referred and substantially helpful imaginative resource for thinking about our entangled pasts, presents, and futures with technologies while tapping into the critique of militarism, capitalism, and histories of male-domination. By combining cultural criticism with imagination, the cyborg reflects how a sociocultural understanding of imagination is activated through feminist SF, as we shall further delve into in the second chapter.

Chapter II

Figures of Feminist SF, The Cyborg and Deconstruction of Prevalent Stories

So far, I have introduced Haraway's ideas on feminist SF practices and her approach to storytelling. I gave a background on the social and historical conditions in which Haraway's cyborg was born, and I have elaborated upon the concepts' roots which goes back to the aftermath of World War II, in the Cold-war space race. I have covered how the cyborg emerged as a figure of feminist imagination and irony, based on Haraway's evaluations and observations on the conditions of the time and the technological developments. In this chapter, I aim to demonstrate how feminist SF activates undertake a sociocultural understanding of imagination by engaging Ursula Le Guin's 'carrier bag theory', together with Donna Haraway's use of the concept of the cyborg. The sociocultural framing of imagination is crucial to study in the context of Feminist SF, because it allows to draw a link between the critical cultural perspectives and questionings of feminist writers to their speculative, fictional works and approaches to futures. These efforts by feminist SF writers inspire and include different forms of creative, artistic and scientific practices within the ongoing games of SF.

First, I will look into Ursula Le Guin's work, specifically her short essay "The Carrier Bag Theory of Fiction" (1986), as it provides a deeper understanding of how prevalent historical storylines and their narratives have an important place in the construction of the collective understandings around technocultural developments. The stories told by various social actors influence fundamental ideas in which people imagine themselves to fit within a social and historical context. These narratives give rise to certain understandings of the world and shape understandings around cultural and technoscientific advancements, as I have mentioned together with Jasanoff's work on imaginaries.

Going into the cultural and historical origins of ideas and questioning how prevalent storylines influence particular worldviews is essential to deconstruct for feminist SF writers such as Donna Haraway. To demonstrate this suggestion, I will look into how the feminist SF tackles the idea of human-exceptionalism, which is an idea that has led a substantial amount of people to imagine and act as superiors to Othered beings for centuries. In parallel, I will return

to Haraway's cyborg to show how the concept, as a feminist figuration, has encouraged telling other kinds of stories to unsettle the established understandings of cultural history and of technoscientific practices.

Haraway has used the concept of cyborg for cultural criticism. However, the use of the concept of the cyborg has received controversial responses for giving rise to techno-utopian views. Considering the cyborg as a figure within collective imagination, I will point out how the figure exposes the doubts and hopes around the future of technoculture. By engaging the cyborg figure, my goal is to explain how Haraway aimed at converting the masculinist, human-centered ways of thinking as a tactic of feminist SF practices. Considering the technoscientific and social transformations during the period when the *A Cyborg Manifesto* was introduced in the 80s, the cyborg will be considered an intervention and resistance to male dominant views and representations of gender-biased developments of technoscience.

Haraway's cyborg has ultimately led growing interests to flourish around feminist technoscience studies, studies of gender-technology relationships and have encouraged creating alternative narratives to masculinist depictions of cultural developments and technoscience. Through her use of the cyborg concept, we will see how Haraway's attention was directed at resisting the male-centered narratives around the body, and around technoscientific developments. In *A Cyborg Manifesto*, Haraway (1985) wrote, "perhaps the most promising monsters in cyborg worlds are embodied in non-oedipal narratives with a different logic of repression, which we need to understand for our survival." (p.8)

The Carrier Bag Theory of Fiction and Feminist SF

In the first chapter, we have covered how specific belief systems and collective ideas can be understood together with the study of social imaginaries. Sociocultural perspectives on social imaginaries point out that "imaginaries constitute a multiplicity of beliefs, values, worldviews that give meaning to social practices." (Bendor, 2018, p.176, Taylor, p. 2004) Stories are powerful cultural artifacts. Through stories, different social actors engage in imaginative work; they create and speak to different social imaginaries. As I have mentioned in the previous chapter, writers of feminist SF have emphasized the importance of paying attention to the kind of stories that are prevalently told. In this section, I will begin

demonstrating how a sociocultural framing of imagination is activated within the context of feminist SF practices by looking at Ursula Le Guin's essay "Carrier Bag Theory of Fiction." Later on, I will delve more into how feminist SF combines cultural criticism with storytelling and imagination by engaging Haraway's use of the cyborg concept.

In an interview with Donna Haraway, from the book *Art in the Anthropocene*, "she asserts: "SF is full of old, important feminist figures."⁹ (Turpin, Davis, 2015, p.257) An influential name behind the development of the collaborative practices of feminist SF is feminist science fiction author Ursula Le Guin. Finding similarities between storytelling practices and the game of playing string figures (which require an engagement with others), Haraway often refers to Le Guin's writings in the context of feminist SF practices. The string figure metaphor for storytelling practices within reach of feminist SF owes its core ideas to Le Guin's fictional and non-fictional worlds informed by cultural and anthropological insights.

Growing up with an anthropologist father, Alfred Louis Kroeber, has substantially influenced Le Guin's understanding of the practice of storytelling and her writing style in the sci-fi genre. For Le Guin, storytelling in science fiction is not detached from social and political issues, as fictional worlds offer a possibility to imagine, think, and reflect upon diverse (social) phenomena. As we go about our lives we seem to forget the imaginative aspects of our experiences of living in a social world, of confronting a set of cultural beliefs, values, and worldviews through our interactions (while shaping our own) every day. Fiction, according to Le Guin (2004), comes from the experience of the author; it is the altered, modified version, or often a reflection of the author's actual experiences.

"Science fiction properly conceived, like all serious fiction, however funny, is a way of trying to describe what is in fact going on, what people actually do and feel, how people relate to everything else in this vast sack, this belly of the universe, this womb of things to be and tomb of things that were, this unending story." (Le Guin, 1986, p.8)

⁹ Haraway (2015) reminds us tentacular figures here, together with the game of string figures. She explains how she is drawn to tentacular figures of SF such as *Medusa*, *Cthulhu* in H.P Lovecraft. She explains how these figures are informing here storytelling practices. In doing so, Haraway draws connections to other forms of sensing and understanding the world, which involves different practices as well (e.g, studying coral reefs through photography). She informs us on how she has been interested in 'reclaiming visibility as a becoming-with or being-with,' since *A Cyborg Manifesto*. (p. 257)

The short essay “The Carrier Bag Theory of Fiction” was written in 1986 by Ursula Le Guin. The essay signalizes some of the ideas behind the creative tactics of feminist SF that realize the sociocultural role of imagination, which I aim to build further upon in this chapter. In the essay, Le Guin builds her “theory of fiction” upon anthropologist Elizabeth Fisher’s theory “carrier bag of human evolution.” Fisher introduced the carrier bag theory of evolution in the book *Woman’s Creation: Sexual Evolution and The Shaping of The Society*. Fisher’s (1979) book presented her research on the role of women in Western society. Starting with analyzing the sex roles within nonhuman primates, Fisher has extended her research to early hunter-gatherer cultures, and she has offered an elaborate, feminist analysis of the history of gender roles.

Le Guin (1986) begins her essay by introducing insights from Fisher’s book. The use of the carrier bags within early hunter-gatherer cultures helped carry and share the food, consisting mainly of plants, vegetables, fruits, and nuts. In her book, Elizabeth Fisher has asserted that the first used by the early hunter-gatherers, the first “cultural device” (or technological device) was the carrier bag, and she further suggested that women invented the carrier bag. Fisher’s suggestion has challenged the long-held belief that the first cultural devices were tools such as knives, weapons, or spears. Building upon Fisher’s anthropological insights from her research on hunter-gatherer cultures, Ursula Le Guin has developed her carrier bag theory of fiction in her short essay.

Fisher’s research aimed at challenging the common belief around the first cultural device. “Many theorizers feel that the earliest cultural inventions must have been a container to hold gathered products and some kind of sling or net carrier. So says Elizabeth Fisher in *Women’s Creation*.” And she adds: “But no, this cannot be” (Le Guin, 1986, p.3) Quoting Fisher’s insights, Le Guin (1986), captures the surprise that the insights from Fisher’s research might give a lead to. With her research, Fisher aimed to expose how the common historical storylines around hunter-gatherers emphasize the hunting aspect but not the gathering as a driving reason for making the first tools. Hence, Le Guin realizes the prevalent historical storylines that focus on the hunters’ role, and their tools promoted as the driving force behind culture’s technological and social advancements.

Both authors notice a gap within this popular storyline which awakes our collective historical imagination in a particular way with an emphasis on the hunting and killing practices

of the early human communities. Picking food and carrying it at home is a crucial practice for survival, yet it is rarely mentioned. This gap in our collective historical imagination is brought to our attention first by Fisher and later on by Le Guin. What function can the knife or a spear have if the food is not carried at home? Concerning this, Le Guin asks, “What’s the use of digging up a lot of potatoes if you have nothing to lug ones you can’t eat home in--with or before the tool that forces energy outward, we made the tool that brings energy home?” (p.4)

In the first chapter, I mentioned how science fiction storylines play an essential role in giving shape to or expressing collective imaginaries. As an ‘adherent’ of Fisher’s carrier bag theory, Le Guin (1986) in her essay signalizes how science fiction reflect particular collective imaginaries as she gives an example of the familiar image of the archaic Ape Man from “the movie.” (p.3) Although she does not make an explicit reference to Kubrick’s *2001 Space Odyssey* -like Haraway (1987)- she is referring to the film’s opening scene.

“I believe, that the Ape Man first bashed somebody within the movie and then, grunting with ecstasy at having achieved the first proper murder, flung up into the sky, and whirling there it became a space ship thrusting its way into the cosmos to fertilize it and produce at the end of the movie a lovely fetus, a boy of course, drifting around the Milky Way without (oddly enough) any womb, any matrix at all?”

(Le Guin, 1986, p.3)

Mentioning the popular stories around the archaic hero image, Le Guin specifies how the representations of the male-hero-hunter figures haunt our collective imagination. “We’ve heard it, we’ve all heard all about all the sticks and spears and swords, the things to bash and poke and hit with, the long, hard things, but we have not heard about the thing to put things in, the container for the thing contained” (Le Guin, 1986, p.4) As the hero-hunter image dominates the collective imaginaries, Le Guin rejects to glorify the stories of killing and refuses to pursue telling the stories of the tools and technologies that make it possible. Instead, Le Guin writes from a gatherer-woman’s perspective who carries her children and wild oats in a carrier bag. “Not, let it be said at once, an unaggressive or uncombative human being. I am an aging, angry woman laying mightily about me with my handbag, fighting hoodlums off. However, I don’t, nor does anybody else, consider myself heroic for doing so. It’s just one of those damned things you have to do in order to be able to go on gathering wild oats and telling stories.” (Le Guin, 1986, p.5-6)

With her carrier bag theory of fiction, Le Guin hints at the importance of paying attention to the dominant forms of storylines. The hero image is problematic because it dominates and limits the collective imagination by presenting a linear, single-sided history of human culture and gives a limited view on the history of techno-cultural developments. Importantly, Le Guin adds:

“If, however, one avoids the linear, progressive, Time’s-(killing)-arrow mode of the Techno-Heroic, and redefines technology and science as primarily cultural carrier bag rather than weapon of domination, one pleasant side effect is that science fiction can be seen as a far less rigid, narrow field, not necessarily Promethean or apocalyptic at all, and in fact less a mythological genre than a realistic one.” (Le Guin 1986, p. 170)

Le Guin’s carrier bag theory of fiction demonstrates the transformational power of stories by refusing to carry on with the linear, progressive narratives that are still influential governing logics and understandings behind technoscientific developments. It captures the profound influence of storylines on collective social imaginaries. Aside from highlighting the importance of giving space to other stories that do not glorify the hero, or the act of killing, Le Guin provides a crucial understanding of technologies as a cultural carrier bag. This understanding of technologies as reflective of the social, historical, and political processes they have brought up in, much like a cultural carrier bag put forward by Le Guin, can be regarded as an essential landmark in feminist studies technoscientific developments from the 80’s onwards. Having a crucial part within these developments in the gender-technology studies within the ’80s, Haraway’s use of the cyborg concept is an important figure to look at how technologies can be understood as carrier bags of cultural beliefs and collective imaginaries.

Le Guin’s carrier bag theory of fiction offers a critical starting point to understand how Haraway’s ideas around feminist SF practices were shaped. Haraway became affiliated with the sci-fi genre in her early adulthood. Later on, she has been a strict follower of science fiction; works of feminist sci-fi writers were specifically influential for her questionings on technoscientific developments and scientific narratives. Making a reference to Le Guin’s carrier bag theory, Donna Haraway in an interview asserts: “storytelling is about collecting things up into a net, a bag, a shell, a recipient, or a hollow, for sharing.” (Turpin, Davis, 2015, p.257) Le Guin’s interpretation of carrier bag theory and its anthropological insights shows how single-sided narratives paint a limited picture of the history of techno-cultural developments. By

voicing the woman with a carrier bag, Le Guin adds another piece to the missing part of the story. As we have touched upon in the first chapter, Haraway's understanding of feminist SF practices gives priority to the collaborative practices of telling big enough stories. The big-enough stories in the context of feminist SF, address the prevalent human-centered, killing stories that significantly narrow our historical imagination.

“Ursula Le Guin taught me the carrier bag theory of storytelling and of naturalcultural history. Her theories, her stories, are capacious bags for collecting, carrying, and telling the stuff of living. “A leaf a gourd a shell a net a bag a sling a sack a bottle a pot a box a container. A holder. A recipient””

(Haraway, 2016, p.118)

Various disciplinary crosses inform the stories of feminist SF, and they incorporate a wide range of artistic and scientific making and thinking. First, I will look further into how feminist SF practices criticize and challenge the prevalent forms of human-centered, masculinist worldviews, proliferated with the involvement of different social actors. Later, I will turn to the cyborg figuration as an outcome of feminist SF and demonstrate how feminist SF engages with the normative modes of thinking through storytelling and imagination; keeping in mind Le Guin's carrier bag theory of fiction as a key reference point within this elaboration.

Noticing Big Enough Stories

“Both imaginary and material, figures root peoples in stories and link them to histories. Stories are always more generous, more capacious, than ideologies; in that fact is one of my strongest hopes. I want to know how to inhabit histories and stories rather than deny them. I want to know how critically to live both inherited and novel kinships, in a spirit neither of condemnation nor celebration. I want to know how to help build ongoing stories rather than histories that end.” (Haraway, 2004, p.1)

Science fiction and storytelling are ways in which feminist SF practices critically reflect upon the existing sociocultural dynamics. Beyond that, the potential of science-fiction "for imagining a different world was for Haraway its feminist attraction." (Åsberg, 2010, p.14) In this section, I will demonstrate how feminist SF realizes the social role of imagination and how

this realization guides sociocultural criticism over "culturally normal fantasy of human exceptionalism." (Haraway, 2008, p.11). I will first consider some of the influential cultural storylines that feminist SF practices consider necessary to deconstruct. Later on, I will engage Haraway's use of the concept of the cyborg to demonstrate how feminist SF critically engages with the origins of the stories that give rise to certain conceptions of the world, such as ideas of human exceptionalism ingrained within the 'Man'-made narratives. I should note that in order to understand the mixed practices of feminist SF better and to consider what feminist SF contribute to our understanding of our complex (hi)stories on Earth, I will occasionally return to Haraway's personal and research background in the continuation of this chapter.

Haraway's work has been informed by her biology background and her acquaintance with history of science, feminism, and Marxist philosophy. (Munnik, 1997,p. 98) She has touched upon various disciplinary intersections through her work; however, she has also avoided labeling her writings under strict categories. The existing systematic inequalities in society and the faulty moral engagements with other-than-human beings have always been critical for Haraway's work, and she has turned for imagination as a feminist faculty while acknowledging the importance of the arts and different forms of cultural experiences and discourses of different social mechanisms in shaping and perpetuating particular collective worldviews, social beliefs and values. The cyborg precisely exemplifies this purpose by integrating the imaginational dimension of the concept to provide a critical, and challenging way of thinking on the sociopolitical dynamics of technoculture and the ontological distinctions made between nature and culture, human and nonhuman. In this section, I will consider some of the recurring modes of criticisms in Haraway's work that are directed at challenging ideas of anthropocentrism, which are core to practices of feminist SF. By referring to some of the relevant perspectives, I will return to Haraway's implementation of the cyborg concept to further demonstrate how practices of feminist SF embrace and combine sociocultural criticism with imagination and fiction.

Haraway's body of work and a growing number of feminist, posthumanist perspectives undertake a recurring mode of criticism is directed at the ideas of anthropocentrism or human exceptionalism. Trained in biology, Haraway has acknowledged that the human body is constituted of interspecies relations. The conception of the human body as an isolated, singular system is challenged if we think about the billions of microorganisms such as bacteria, archaea,

and fungi that inhabit our bodies. In *When Species Meet*, she modified Bruno Latour's 1991 book title to "We Have Never Been Human."

"I love the fact that human genomes can be found in only about percent of all the cells that occupy the mundane space I call my body; the other percent of the cells are filled with the genomes of bacteria, fungi, protists, and such, some of which play in a symphony necessary to my being alive at all, and some of which are hitching a ride and doing the rest of me, of us, no harm." (Haraway, 2008, p. 3-4)

Following her goal to trace the anthropocentric establishment of the separation of human category from the animal, Haraway turns her attention to engage with the "great historical wounds to the primary narcissism of the self-centered human subject." (Haraway, 2008, p. 11) At the core of the assumption of human exceptionalism lies a model of hierarchical thinking which gives rise to a human-centered view of the world, organized with the categorical separations of the subject from object, nature from culture. Haraway looks at Freud's work on the Western psyche to specify the 'wounds' that have caused significant damages to the "fantasy of human exceptionalism." (Haraway, 2008, p.11) She summarizes the three historical turns in Western society that have presented compelling challenges to the human-centric views of the world.

First, Haraway mentions the Copernican revolution in the 16th century, as it has removed the Earth from the center of the universe. Secondly, she mentions the Darwinian wound. Darwin's (1859) *On the Origins of Species* followed the Copernican revolution by placing Homo sapiens with other species on Earth, amongst other animals. When Darwin's book was first introduced in the 19th century during the Victorian era, it had profound influences on literature, art, religion, and scientific thinking. The writers of science fiction during this era were enthusiastic to apply Darwin's theory in their own writings. The third wound is Freudian, which has faced us with the traits of the unconscious. Referring to Haraway's *When Species Meet* Joanna Zylinska (2015) notes, these three turns "—have seriously destabilized humanity's geographical, historical, and psychic self-centeredness." (para.3)

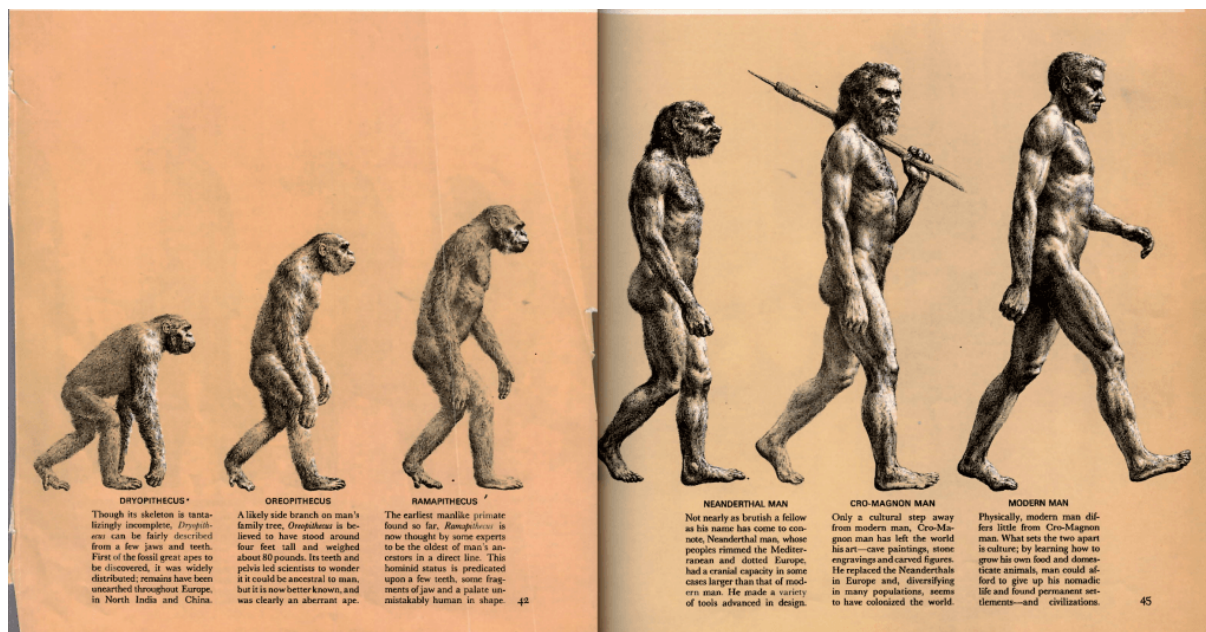


Figure 2. "The Ascent of Man" visualization by Rudolph Zallinger -Life Nature Library 1965

The historical wounds on the Western psyche, which Haraway specifies, presented serious questions to the particular categorizations that have influenced how humans have imagined themselves to fit into the planet with others over centuries. As we have seen with Ursula Le Guin's interpretation of Fisher's carrier bag theory of evolution, this image has been predominantly shaped through a Western, patriarchal mode of placing the figure of 'Man' as the center of a cultural, historical conception that glorifies linear progress, which might be accurately exemplified with a familiar image of *The Ascent of Man* or *The March of Progress*. This image, firmly placed in our collective imagination, can be considered as an indicator of the socio-cultural values in line with limited understanding of the theory of evolution, which has been used to determine what counts as cultural progress.

"That's right, they said. What you are is a woman. Possibly not human at all, certainly defective. Now be quiet while we go on telling the Story of the Ascent of Man the Hero."
(Le Guin, 1986, p.5)

In addition to Haraway, the binary separations of nature from culture, the human from animal, were traced back to Western philosophical thinking with the works of anthropologists such as Philip Descola. Descola's works have often been considered under the ontological turn in anthropology, which is stated to be originated from the works of scholars in the Global South. (Anderson, 2013, p. 208) While Haraway provides an analysis of the historical events that have

challenged the human-centered worldviews, Descola offered an analysis of historical processes that have had supported anthropocentric worldviews by looking at the historical events that have led to a nature-culture dichotomy in Western world.

Philip Descola (2013), in *Beyond Nature and Culture*, has offered a comprehensive study of nature- culture dualisms, focusing on the analytic categories embedded in Western thought. Providing an extensive analysis of the historical development of nature- culture dualisms, Descola has additionally investigated Amazonian animisms, Western naturalistic cosmologies, Australian totemisms, and Aboriginal analogisms, to analyze the ontological configurations which have influenced the ways in which differences between humans and animals were made on the basis of their mental, physical and subjective qualities, across different sociocultural contexts. (Descola, 2013, p. 8)

Descola (2013) has demonstrated four breaking points in the Western historical context that has laid the foundation of nature and culture dichotomy in Western cosmological conception. Starting from the Aristotelian classification of the animals based on a scheme that represented animals' physical characteristics, Descola traces the roots of Western naturalist conceptions until the 17th century Scientific Revolution. Aristotle's classification of animals is the first key turning point that created a nature/culture separation, according to Descola. Secondly, Descola (2013) points out how the Christian belief has separated the human from Nature by announcing humans as 'divine beings' created by God. According to the Aristotelian classification of animals, humans were recognized as part of the Nature. Later on, with Christianity, humans acquired a superior position compared to other beings. According to Descola, Christian idea of Creation has crossed paths with the Aristotelian ideas of nature in the middle ages. Although obsessed by the idea of the Creation and its consequences, the Middle Ages also retained some of the lessons learned from antiquity. "This produced a plethora of syntheses on the unity of Nature, combining biblical exegesis with elements of Greek physics, especially from the twelfth century onward, when Aristotle's works were rediscovered." (Descola, 2013, p.44). With this encounter of Greek physics and Christian belief, an understanding of nature as a reflection of God's divine creation was emanated. Nature with its harmony and totality, was figured as an "evidence of the divine creation." (Descola, 2013, p.44)

According to Descola, nature and culture dualism was strengthened with the Industrial Revolution in the 17th -18th centuries (2013), and a mechanistic understanding of Nature had been validated. (p.41) According to the mechanistic view of Nature, the world is perceived as operating similarly to a machine. According to this understanding, Nature could be organized, its parts could be assembled, and altered by humans just like a machine. "What now came into existence was a notion of Nature as an autonomous ontological domain, a field of inquiry and scientific experimentation, an object to be exploited and improved; and very few thought to question this." (Descola, 2013, p.45) Feminist scholars, especially under the ecofeminist school of thought, such as Carolyn Merchant, have referred back to the 16th century Scientific Revolution as a turning point for leading a mechanistic understanding of Nature. Feminists went further into this questioning to understand the processes that carved out underlying values of modern industrial society.

Donna Haraway, approached the nature-culture dichotomy from a slightly different perspective as she adds a fourth challenge to the human-centric worldview through mentioning the informatic or the 'cyborgian' wound "which infolds organic and technological flesh." (Haraway, 2008, p.12) With her use of the concept of the cyborg, Donna Haraway (2008) undertakes a challenging responsibility for going beyond "the Great Divide" (p.12) of Nature and culture, organic and technological dualisms. Haraway suggests that the technics do not always have to be perceived as repressive or exploitative. In *A Cyborg Manifesto* she asserts:

"...the analytic resources developed by progressives have insisted on the necessary domination of technics and recalled us to an imagined organic body to integrate our resistance. Another of my premises is that the need for unity of people trying to resist world-wide intensification of domination has never been more acute. But a slightly perverse shift of perspective might better enable us to contest for meanings, as well as for other forms of power and pleasure in technologically mediated societies."
(Haraway, 1985, p.15)

The slight perverse shift of perspective introduced through the cyborg figuration should not be perceived directly as a manifestation of Haraway's utopian beliefs around technoscientific developments. Haraway indeed avoids an anti-scientific or anti-technological approach in her thinking. Still, she certainly did not ignore the racist, patriarchal social

dynamics and misogynist attitudes toward women behind the Scientific Revolution in the 16th-17th century within Europe as other feminist scholars commonly have analyzed.

“In the traditions of “Western” science and politics—the tradition of racist, male dominant capitalism; the tradition of progress; the tradition of the appropriation of nature as resource for the productions of culture; the tradition of reproduction of the self from the reflections of the other—the relation between organism and machine has been a border war. The stakes in the border war have been the territories of production, reproduction, and imagination.” (Haraway, 1985, p.7)

Haraway's approach to the history of science, as René Munnik (2001) points out, involves looking at the methods, models, and concepts that have played a part in constructing an "orthodoxy of an established normal science." (p.98) In her book *Primate Visions*, Haraway (1989) showed how her studies on primates have led her to think about the nature-culture dichotomy. Haraway has noted that her observations on how primates started with the realization of how these creatures are part of "popular cultures, movies, technical field studies, part of social psychology, part of evolutionary biology, and part of zoo management"; She has observed how: "These creatures existed at the boundaries of many constituencies that figured and carried the meanings of many kinds of stories in their bodies." (Munnik, 2001, p. 99) Haraway observed that the stories told about primates were a clear demonstration of the distinctions made between the human and animal. Her research on the scientific studies of the primates and the human-animal separation exposes a highly racialized story, closely linked with colonial origins of the systems of scientific classification.

Haraway's inquiries on the history of science and scientific knowledge is focused on deconstructing the kinds of stories that are being told since these stories provide hints into representations or figures (e.g., primates) in "which many people's imaginations are condensed." (Haraway, 1989). In her writings, Haraway has been attentive to the profound impacts of the stories told by science and other social mechanisms. The critique and deconstruction of social beliefs, future visions, and imaginaries around technoscientific developments have a crucial place in Haraway's writings, which would not sit comfortably with messianic views that glorify new technologies or accepting scientific knowledge as unquestionable truth. As Judy Wajcman (2004), writes: "For Haraway science is culture in an

unprecedented sense. Her central concern is to expose the "god trick," the dominant view of science as a rational, universal, objective, non-tropic system of knowledge." (p.83)

Growing up in a Catholic environment has influenced Haraway's thinking on the history of scientific knowledge, techno-scientific developments, and her inquiries into the conceptions around the notion of Nature. In Christian theology, the Garden of Eden is where the first act of creation took place. Edenic mythology offers an imaginary utopia that has shaped a common understanding of Nature in Christianity. The Edenic vision paints an unspoiled, pristine, and innocent vision of Nature created by God, which has also influenced understandings of human Nature. The Edenic understanding of human Nature was shaped around the idea that "God created humans in His image (*imago Dei*)."

(Midson, 2015, p.28, emphasis in original)

In his doctoral thesis, Scott Midson (2017) offers an analysis of the Edenic mythology as he looks at how Haraway's cyborg posited a challenge to Edenic mythological narratives. He observes that according to the Edenic mythology, like humans, God created animals in the Garden of Eden, yet still they appear as lesser creatures compared to humans. (p.154)

Going back to Descola's analysis on the Nature of Christianity, he has mentioned how the vision of the human as a divine creation exposes the anthropocentric inclination ingrained within Christian belief. Haraway (1985) asserted in *A Cyborg Manifesto*, "the cyborg would not recognize the Garden of Eden; it is not made of mud and cannot dream of returning to dust." (p.9). With this quote, she delves into the questioning of religious origins of the stories in which the human-centric worldviews had been proliferated. Haraway introduces the cyborg a hybrid of machine and animal-human (organism), and poses it as a challenge to the Edenic myth of Nature, a powerful story that underlies the nature-culture, animal-human dualism. Midson (2015) explains how according to the Edenic myth of the Nature has played a part in shaping the understanding of Nature as the 'other' place (existed before culture) "in an innocent and harmonious state." (Midson, 2015, p.26)

Challenging a pristine vision of (human) Nature, the cyborg presents us with the goal of feminist SF to decentralize the category of human. Furthermore, Haraway's positioning of the concept allows us to face the varied origins of the stories that shape the collective imagination.

"We tell ourselves stories about how we are secular, for example, but this does not negate the theological stories, such as the Edenic myth of origins, that continue to underwrite our outlook to things like technologies or other animals, both of which are important to the cyborg that tells a different story about our relationship to these beings. Haraway narrates through the cyborg how the distinction between humans, animals, and technologies is misguided, but she is equally aware of the narratives that prefigure her critiques." (Midson, 2015, p. 23)

Haraway has positioned the cyborg concept as a feminist figuration. She introduced the cyborg as a in the intersections "of fractured identities and border zones of many kinds, like the bridging of the human body and other biological organisms." (Åsberg, 2010, p. 15) In doing so, she encourages thinking about the notions such as hybridity to challenge the racialized and anthropocentric stories proliferated through the narratives advanced by the historical processes shaped with the inclusion of social institutions diverging from religion to science. By using the cyborg concept, Haraway aimed at challenging the popular narratives and deconstructing big enough stories that take part in shaping collective imaginaries. I will now engage cyborg as an outcome of feminist SF practices, and consider it as a figure within collective imagination in order to better explain how feminist SF undertakes an imaginative labor and challenges taken for granted social, political constructions following my research question, "how do the practices of feminist SF conceptualize imagination?" I will discuss how Haraway's use of concept aimed at confronting the androcentric establishment of technoscientific culture under patriarchal capitalism by pointing out that there might be another side to the story.

The Cyborg to Convert Prevalent Imaginaries of Technoculture

STS scholar Cecilia Åsberg asserts that the cyborg "looms largely over feminist questions regarding the possibilities of technoscience to change the world as we know it." (Asberg, 2010, p.1) More than three decades later, the cyborg concept remains relevant within academic discourse concerning human-technology relationships and feminist studies of technoscience. As we have seen so far, Haraway's use of the concept has encouraged thinking about the notion of hybridity by tapping into the long made divisions between nature and culture and its underlying ideas driven by a fantasy of human-exceptionalism. While the cyborg concept functions as a critical figure to understand humans' evolving relationships with

technologies, the cyborg has also caused controversy; even its liability as a feminist figuration was highly debated. In this section, I will look into how the cyborg figuration can be realized as a figure within collective imagination and how Haraway by announcing the cyborg as a feminist figuration aimed at criticizing, exposing the storytelling techniques of the institutions operating under male-dominant capitalism while undertaking a feminist tactic of converting these stories.

Feminist scholars have often pointed out different versions of their visions of Haraway's cyborg figuration. For example, art theorist and cultural media scholar Yvonne Volkart (2004) describes her vision of the cyborg as an "ageless, naughty and unruly girl." (para.4) This description of the cyborg image as an unruly, untamed, stubborn girl can be considered in line with the optimistic, rebellious attitude that the early cyberfeminists embraced in their engagement with new technologies. Within the feminist study of technologies, cyberfeminism emerged as a movement to theorize new media technologies in the 1990s. The movement, inspired by Haraway's cyborg, has emerged alongside the feminist studies of the internet with profound connections to the science fiction genre. Sollfrank (2002) explains that the 'cyber' prefix, derived from cybernetics, was inspired by science fiction writer William Gibson's cyberpunk novels. Gibson's novels have included depictions of the female and techno-hybrid characters, *fembots*, and *cyberbabes*. The depictions of female technological hybrids have reflected sexist fantasies on the female body through the means of sci-fi and popular culture. Undertaking the 'cyber' prefix, cyberfeminists have similarly aimed at embracing the underlying ironic 'twist' embedded within the figure of cyborg.

In a more recent study on gender-technology relations, with her 2004 book *Technofeminism*, Sociologist Judy Wajcman (2004) has focused on how a feminist perspective on the study of the technologies might contribute to our understandings of the development and history of technoscientific knowledge. In the book, she emphasizes how Donna Haraway's work and her cyborg have exposed technoscience's patriarchal roots. Wajcman (2004) discusses how Haraway challenges the objectivity of science by situating scientific knowledge in a sociocultural context, as she specifies that technoscientific developments are never independent of social values and processes. Wajcman builds her inquiry upon cyberfeminist insights on the relationship between women and technology, inspired by Donna Haraway's cyborg. Wajcman (2004) stresses some of Haraway's intentions

behind introducing the cyborg include a desire to create new kinds of narratives around technoscientific developments and the futures of technoculture.

"Haraway urges us to engage fully with the dramatic challenges generated by our informational, technocultural times. She embraces the positive potential of science and technology, to create new meanings and new entities, to make new worlds."

(Wajcman, 2004, p. 80)

Acknowledging that the cyborg figure's potential for encouraging to rethink the gender and power relations embedded within technologies, Wajcman points out potential risks that may arise from Haraway's use of the cyborg concept. As was the case with the earlier accounts of cyberfeminism, she highlighted that the cyborg might result in a fetishization of new technologies. (Wajcman, 2004, p. 108) Addressing the extremist perspectives that lead to unsatisfactory dualisms between feminists theories on technologies, Wajcman asserts: "Feminist theories of the woman-machine relationship have long oscillated between pessimistic fatalism and utopian optimism. The same technological innovations have been categorically rejected as oppressive to women and uncritically embraced as inherently liberating." (Wajcman, 2004, p.103) Like Haraway, Wajcman (2004) emphasizes the significance of paying attention to the sociocultural context in which technoscientific developments are introduced into; as technoscientific developments are never value-neutral. (p.17)

One of the perhaps less intended things that the cyborg figuration does so successfully is making visible the different collective beliefs, visions of desirable or attainable futures of technoculture following Jasanoff's (2004) definition of socio-technical imaginaries. (p.4) In this sense, we can think of the cyborg as a figure within collective imagination that makes visible diverse understandings of social life and visions around socio-technical developments. The cyborg's ties with the military-industrial complex has led some feminist scholars to reject the cyborg's potential to provide a critical perspective on gender relations ingrained within technoculture. The cyborg figuration was criticized for being an outcome of Western-oriented thinking and perpetuating the modern ideas of technoscientific progress, driven by the logics of patriarchal capitalism. (Lykke, 1997, p.6) However, these criticisms for the most part, have missed the irony and criticism that Haraway aimed at bringing forward through the cyborg. Accordingly, Haraway (2004) asserts:

"...from the beginning, the manifesto was very controversial. There were some who regarded it as tremendously anti-feminist, promoting a kind of blissed-out, techno-sublime euphoria. Those readers completely failed to see all the critique." (p.324-325)

As we have seen so far, starting with Le Guin's carrier bag theory, one goal of practices of feminist SF is to deconstruct prevalent technocultural, scientific stories by situating them within a broader historical, social context. As masculinist values based on progress, speed, efficiency continue to influence the motives behind technoscientific developments (Skågeby, Rahm, 2018,p.12), feminist SF practices undertake a tactic of challenging and converting the dominant storylines by combining sociocultural criticism with imagination. Continuing with Haraway's use of the cyborg concept, I will now continue to demonstrate how feminist SF engages in its own creative imaginative labor to go beyond the imagination of the future of technoscientific developments guided by over-determined by heroic tales driven by the motives to conquer and expand.

"Technology," or "modern science" (using the words as they are usually used, in an unexamined shorthand standing for the "hard" sciences and high technology founded upon continuous economic growth), is a heroic undertaking, Herculean, Promethean, conceived as triumph, hence ultimately as tragedy. The fiction embodying this myth will be, and has been, triumphant (Man conquers earth, space, aliens, death, the future, etc.), and tragic (apocalypse, holocaust, then or now)." (Le Guin, 1986, p.170)

Both Haraway (2016) and Zyliska (2018) notice that the Anthropocene discourse seems to be carried away with apocalyptic world-ending scenarios while continuing to "praise human ingenuity and problem-solving skills, and to promote capital-driven solutions to climate change, such as nuclear fission, carbon-offsetting, and geoengineering," (Zylinska, 2018, p. 7) Technological solutions are performed in the public eye with the promises of offering a better future. Examples of technofixes or technological solutions can be found anywhere, as multinational technology companies acquire a big share in marketing and presenting their versions of ideal futures.¹⁰ In *A Cyborg Manifesto*, Haraway (1985) asserts, "the multinational

¹⁰ The narratives are driven by the market-led motives of start-up, company culture promoted with the ideas of progress and smartness loom over the popular imagination. 'Smart' futures are presented and advertised through the visions of efficiency, speed, sustainability. The proposals for these projects have

material organization of the production and reproduction of daily life and the symbolic organization of the production and reproduction of culture and imagination seem equally implicated." (p.36) With this quote, Haraway specifies how the organization of daily life under globalized production mechanisms is intrinsically related to the imaginary work of various social actors.

In a short essay, "Wondering about Materialism" Isabelle Stengers (2011) addresses the eliminativist and reductionist modes of thinking within academia and in various scientific circles. Referring to eliminativist perspectives, Stengers warns against the threat of falling into a classification and reduction of what kinds of knowledge would matter under the motives of industrialized science. Stengers (2011) mainly refers to works within academia to address such clashing perspectives with humanities (she refers to this clash as academic war-games). However, she notes that this threat might actually be preparing "the ground for other kind of operations." (p. 371) Therefore, she signifies the cruciality of the need for narratives that cover the messiness, complexity of our world. To exemplify, Stengers refers to Haraway's brave and versatile writings that diverge from her cyborg to other companion species, such as her dog *Cayenne*, which builds substantial correlations between her academic and lived experiences.

"I am convinced that we need other kinds of narratives, narratives that populate our worlds and imaginations in a different way." (Stengers, 2011, p.371)

Figures occupy a central place in how Haraway engages in imaginary work in the context of feminist SF. *Medusa*, *Femaleman*, *Chtulhu*, cyborg, even the 'cultured' gorilla *Koko* occur as her companions to think about, criticize, and unsettle the widely accepted, unquestioned social values and discourses around technoscientific advancements. In *A Cyborg Manifesto*, Haraway wrote: "By the late twentieth century, our time, a mythic time, we are all chimeras, theorized and fabricated hybrids of machine and organism—in short, cyborgs. The cyborg is our ontology; it gives us our politics." (Haraway, 1985, p. 7) When the manifesto was written, the growing technological and social transformations have encouraged Haraway to handle the fundamentally political issues of identity, gender, and body in her writings.

been presented to the public within recent years through electric cars, the use of sensors, and applications with the promise of improving different aspects of daily life.

The increasing ubiquity and miniaturization of technologies have brought technologies closer to the body. Haraway's cyborg intends to bring our attention to the increasing overlapping of human-technological couplings. Pacemaker devices to control the heart rate, artificial organs, pills that regulate hormonal levels are commonly given examples to explain how the cyborg can be thought of as part of our material reality, as a manifestation of our technological condition. (Glabau, 2017, para. 9) Hence, with the cyborg, Haraway draws attention to the growing impacts of technological advancements influential within health, together with the increasing technological modifications on the body.

As I have pointed out in the first chapter, the cyborg concept has close links with the history of space exploration. Manfred Clynes and Nathan S. Kline were the two researchers behind the idea of a space medicine that would modify the human body and allow astronauts to breathe in space without requiring extra equipment. On the other hand, pop-culture depictions of the cyborg and images from popular cinematography (Munnik, 1997, p.5) have been another influencing place where Haraway took inspiration to utilize the cyborg concept. If we consider the prevalent depiction of the cyborg figure in popular culture and science-fictional worlds, these depictions of the cyborg might lead to a slightly different yet connected outlook with Haraway's use of the cyborg concept. I have mentioned in the previous chapter how science fiction storylines face us with depictions of both utopian and dystopian technological futures. Similarly, we encounter utopian and dystopian narratives around the figure of the cyborg in science fiction.

"From Mary Shelley's *Frankenstein*, published in 1818, to Maria, the robot in *Metropolis* (Lang, 1927), to *Frankenhooker* (a film released on video in 1989) the possibilities of human hybrids have fired our cultural imagination..."

(Balsamo, 1996, p.17)

Design scholar Anne Balsamo (1996), in a short review of the famous depictions of cyborgs in popular culture, mentions how cyborgs have made a leap in their popularity within the mainstream media during the 80s. Balsamo provides examples of the magazine *NewsWeeks'* cover of the fictional AI character *Max Headroom* and *Elektra Assassin* created by Frank Miller. Moving onto the late 80s, she explains that the cyborg figure is exemplified by figures such as *RoboCop* (1987) and *Terminator* (1984) movies, *The Transformers* toys, later turned to be film series. Shifting in between the powerful, dreadful

masculine figures or the sexy female technologically altered hybrids, the depiction of the gendered cyborgs in the mainstream media represents a certain vision of the 'ideal' gendered body image or identities of male and female characters, reinforced by technologies. The examples of the cyborgs in pop culture reflect the long fantasies of human-technological enhancements. "From children's plastic action figures to cyberpunk mirrorshades, cyborgian artifacts will endure as relics of an age obsessed with the limits of human mortality and the possibilities of technological replication." (Balsamo, 1996 p.18)

The science fiction representations of the technologically modified, gendered images of the body should not only be conceived as mere media portrayal or a fictional depiction of a distant world. Instead, it should make us think about the cultural processes that lead to the gendered depictions of the body. The modifications of the body to live up to certain reproductive, sexual beauty standards through implants, prosthesis, and a number of other technologies can further support the suggestion that we are cyborgs. Furthermore, these developments also bear the questions around inequality, disability, gender, power, and control with the involvement and unequal distribution of technologies. "The cyborg is a matter of fiction and lived experience that changes what counts as women's experience in the late twentieth century. This is a struggle over life and death, but the boundary between science fiction and social reality is an optical illusion." (Haraway, 1985, p.6) Bearing in mind the cyborg figure's representations in popular mainstream media and culture and the historical background of the development of the cyborg with its connections to the military-industrial complex, the cyborg is often addressed as an opposite of a naïve or an innocent figure. (Åsberg, 2010, p.16) However, as I have touched upon earlier, Haraway is profoundly aware of the challenges the concept has presented. Even her work bears the contradictions of being funded by an institution with connections to military and nuclear research¹¹, which has probably further reinforced her sense of irony that came forward through her use of the cyborg concept.

¹¹ Rene Munnik (1997) mentions Haraway's involvement as a History of Science professor at Johns Hopkins University, an institution known for its ties to defense and nuclear research for the US military. Munnik explains how this involvement within the institution has impacted Haraway's thinking on the economic and social backgrounds of intellectual developments. As she was conscious of the economic dynamics that had supported her research, Munnik observes that "For Haraway, the pretense of innocence was gone forever." (p.3)

Nevertheless, Haraway's desire to challenge and expose the dubious origins of technoscience itself, is embedded within the cyborg. In the first chapter, I have explained how Haraway's ideas around 'storytelling for an earthly survival' stresses the significance of incorporating an understanding of a 'thick present' in storytelling. The cyborg accurately demonstrates this perspective by reflecting on the challenging and unpleasant histories and presents, and of course critiquing them. More central to my concern here, the cyborg has aimed at resisting to patriarchal views that placed 'Man' and the values determined by Man as the main driver behind cultural and technological developments.

As we have seen at the beginning of this chapter, this concern is introduced as a central motivation for feminist SF by Haraway, as exemplified with Ursula Le Guin's (1986) "Carrier Bag Theory of Fiction" aimed at confronting and decentralizing the glorified killing stories of Man. While the cyborg figure's depictions and, more generally, the understandings of technological developments of technoculture reflect human-centered, masculinist, and gendered perspectives, Haraway's *A Cyborg Manifesto* introduces the cyborg as a feminist, genderless figure. As Haraway undertakes a mission of 'rescue' with H.P. Lovecraft's misogynist-monster *Cthulhu* to support her multispecies thinking for an earthly survival, she similarly reclaims the cyborg figure for stimulating shift in the common perspectives that govern the gendered conceptions around socio-technological developments.

Born as an outcome of the practices of feminist SF, the cyborg figure helps to tell a big enough story that challenges the ones that precede it while still striving to acknowledge its situatedness.

"For me, the notion of the cyborg was female, and a woman, in complex ways. It was an act of resistance, an oppositional move of a pretty straightforward kind. The cyborg was, of course, part of a military project, part of an extraterrestrial man-in space project. It was also a science fictional figure out of a largely male-defined science fiction. Then there was another dimension in which cyborgs were female: in popular culture, and in certain kinds of medical culture. Here cyborgs appeared as patients, or as objects of pornography, as "fem-bots" -the iron maiden, the robotized machinic, pornographic female. But the whole figure of the cyborg seemed to be potentially much more interesting than that. Moreover, an act of taking over a territory seemed like a fairly straightforward, political, symbolic technoscientific project." (Haraway, 2004, p.322)

Thinking together with the cyborg figure, in the manifesto, Haraway specifies two possible scenarios that provide an outlook on the possible futures of our global technoculture. On the one hand, she asserts that the future of a 'cyborg world' could be imagined in a manner in which the present-day order is perpetuated. Within the present-day order of technoculture, she criticizes technoscience for being governed by masculinist politics that appropriate women's bodies and impose control over the planet. From the opposite perspective, Haraway asserts that the cyborg world could be a one that is "about lived social and bodily realities in which people are not afraid of their joint kinship with animals and machines, not afraid of permanently partial identities and contradictory standpoints." (Haraway, 1985, p.15) The latter scenario is more in line with Haraway's envisioning of technocultures' future, as specified within her later work in *Staying with the Trouble*. Importantly, both scenarios provided by Haraway, remind us of the uncertainties, complexities, and possibilities that are likely to arise from the engagement with futures.

Playing String Figures for Shared Futures

Feminist SF practices are mixed, as they involve cross-disciplinary and interrelated modes of questioning. As we have seen through the cyborg figuration, feminist SF aims to embrace the *ongoingness* and complexity of stories, of challenges of living in a messy world. More importantly, following Haraway's work and other feminist writers, the mixed practices of feminist SF aim to offer other ways of thinking about the stories of pasts and presents while searching to find ways for a collective flourishing.

“SF is storytelling and fact telling; it is the patterning of possible worlds and possible times, material-semiotic worlds, gone, here, and yet to come. I work with string figures as a theoretical trope, a way to think-with a host of companions in sym-poietic threading, felting, tangling, tracking, and sorting. I work with and in SF as material-semiotic composting, as a theory in the mud, as muddle.” (Haraway, 2008, p. 36)

The ideas to overcome the human-centered mode of inhabiting the world have led Haraway and other feminists such as Anna Tsing to reconsider human-nonhuman relations,

*natureculture*¹² entanglements through a realization of multispecies worldlings that bear the questions of building interspecies kinships. These efforts of feminist (SF) writers have influenced artistic practices and opened a space for the emergence of interdisciplinary fields such as critical animal studies and more-than-human, other-than-human approaches to design and ethnographical research. Much like playing string figures, the collective games of storytelling connect different modes of practice and thinking. For feminist writers, it is clear that the emphasis on tragic tales imposed by Man's killing, heroic undertakings that informs the faith in continuous economic growth and progress (Le Guin, 1986, p.170) has to change. Accompanying feminist SF struggles to go beyond dualisms to transform our ontological imagination, artistic and scientific worldling practices could be considered allies (Kirksey, Helmreich, 2010, p.556), joining in the game of string figures (SF). In the next chapter, building on the theoretical framework of feminist SF and its undertaking of imagination, I will analyze two artworks, *Metamorphosis* and *We Live in an Ocean of Air*.

¹² *Natureculture* is a term coined by Donna Haraway to go beyond the barrier in language that separates nature from culture; one cannot exist without the other.

Chapter III

Contemporary Artistic Approaches on Imagining Alternatives: An analysis under the framework of Feminist SF practices

“The exercise of imagination is dangerous to those who profit from the way things are because it has the power to show that the way things are is not permanent, not universal, not necessary. Having that real though limited power to put established institutions into question, imaginative literature has also the responsibility of power.”
(Le Guin, 2004 p.183)

“If you can image—or imagine—yourself, you can image—or imagine—a being not-yourself; and you can also imagine how such a being may see the world, a world that includes you.” (Atwood, 2011, p.42)

In this chapter, I will analyze contemporary artworks *Metamorphosis*, *We Live in An Ocean of Air*, based on the framework of imagination and the ideas of feminist SF practices, as I have covered in the previous chapters. Artistic and creative practices mobilize imagination in a way that forms a link between the individual and collective levels of experience. Inspired by Anna Tsing’s *Arts of Living on a Damaged Planet*, Davis and Turpin (2019) writes, “art offers a site of experimentation for living in a damaged world.” (p.4) Literature and art offer a site for experimentation for imagination and finding out what other kinds and forms of relationships we may form with Others. A growing number of scholars and artists explore alternatives focusing on human, nonhuman relations, and interspecies dynamics in the face of the global socio-ecological crisis.

The example of the artistic practices will allow me to turn to the questioning of imagination as a sociocultural capacity that might shift the prevalent, rigid forms of thinking that limit itself to what is, towards what might be. In analyzing the case studies, I will take a critical distance towards the artistic and speculative approaches. My goal in this chapter is to evaluate whether the experience of the artworks guide the imagination and thinking of their audience to convey a critical position, and whether their artistic approach reflect their specific conceptual framework coherently. To do so, I will pay attention to how symbolic, metaphorical

dimensions and materiality of the artworks work together with the critical perspective or creative contribution that the artworks aim to set forth. While analyzing the critical and creative approaches and the conceptual and theoretical aspects of the projects, I will engage the artistic choices and goals of the artworks. Furthermore, I will reflect upon the potentials of artworks for stimulating alternative modes of thinking to challenge anthropocentric biases that inherent to techno-capitalism structures through a sociocultural realization of imagination. At the end of the analysis of each case study, I will put forward some critical observations concerning the broader cultural-artistic discourse, by drawing on the ideas of feminist SF that I have covered in previous chapters.

My analysis of the case studies will rely on artists' choices of communication with the audience, recipient observations, and my own experience of the projects. The analysis of the artworks will be shaped around the main research question: how do the chosen artworks illustrate the ideas I have demonstrated within the realm of feminist SF practices? In order to address this question, my analysis will elaborate upon the artistic tone and experiential aspects of the projects, such as the creative choices of use of the technologies, and consider in which ways these artistic choices contribute to the conceptual framework. The chosen artworks address audience's imagination as part of their aesthetic experience. For instance, in the second artwork, *Metamorphosis*, the concept of imagination is mentioned as a critical tool for reflection during the film's interaction with the spectator. In parallel, my analysis will elaborate upon in which ways the aesthetic experience provided by the artworks engage the audience's imagination to encourage relating to other forms of subjectivities, and allow the realization of other worlds. Thinking together with Donna Haraway's metaphor of the game of string figures for feminist SF practices, I consider the artworks as other possible nodes or extensions of the consequential, at times bumpy yet ongoing games of feminist SF.

An Overview of the Case Studies

The first case study is *We Live in An Ocean of Air*. The artwork emphasizes the co-dependency between animals and plants by activating audiences' imagination by offering an interactive virtual reality experience. By translating scientific information, especially from biology, the artwork tells the story of the symbiotic relationship between animals and plants. The first case study will exemplify a cultural experience that aims to challenge the idea of

human exceptionalism through mobilizing the imagination of its audience to relate to the (nonhuman) Other. Feminist SF, as we have seen in the first chapter, undertakes storytelling practices, imagination, and fiction to take over this goal. In the artwork, virtual reality becomes a means to tell the story of the relationship between plants and animals. During the analysis, I will consider how the imaginative experience provided by the artwork is mediated with the use of virtual reality technology. Furthermore, I will critically evaluate how the use of technology in the artwork guides the recipient's imagination to recognize interspecies relations and whether this realization contribute to a goal of de-centering the human.

The second case study that I will analyze is *Metamorphosis*. *Metamorphosis* is a video series; it is brought together with a resemblance to educational science film while incorporating a speculative approach in its proposal for an alternative -queer future. The film criticizes and challenges normative, patriarchal capitalist modes of thinking by engaging imagination as a critical tool within its speculative proposal. According to the artists, the film aims at engaging queerness not only as a defined identity but as an indicator of openness and for change. The metaphor of metamorphosis is put forward by the film as to indicate an inherent transformative power familiar to all living beings on earth. As an organism, the earth is constantly evolving and changing, reflected through the process of metamorphosis. The second case study will demonstrate the role of imagination in challenging established worldviews by positioning imagination as a tool for criticism and transformation. The film will help us realize historical and socioeconomic processes that remain hidden behind the doomsday narratives around climate changes and the Anthropocene discourse. In this sense, the film invites us to think while incorporating a speculative approach to point out another way of organizing our socioecological relations is possible. Evaluating the narration style and communication choices with the spectator, my aim is to provide critical analysis of the film's speculative future proposal.

We Live in An Ocean of Air

We Live in An Ocean of Air is a VR art project by *Marshmallow Laser Feast*, an art collective that engages with insights from social, natural sciences, and biology to create interactive experiences. My first encounter with the art project was during an online event of the *STRP Festival* (2020) called “*Radical Ecology: How plants help us imagine new worlds?*” The online event took place with speakers from diverse interests and backgrounds who were

activists, scholars, multimedia artists, and speculative fiction writers. In their works, the participants strive to understand and find other ways to relate to plants and question the place of plants in a broader cultural-historical perception.

The analysis of the project I will present here will be twofold, with the online version of the project presented as a guided meditation and the on-site VR experience. Firstly, I will introduce the online version of the project, which took place as a guided meditation. For the analysis of the online guided meditation, I will rely on my personal experience of the project. For the VR project, the analysis will mainly depend on the documentations of recipients and found data from visitor observations, audience recordings, and artist interviews. Firstly, in the context of feminist SF practices and the framework of imagination that we have explored in previous chapters, I will consider how *We Live in An Ocean of Air* tackles human-nonhuman relationships through its own artistic approach. I will analyze how the artwork stimulates and guides the audience's imagination through certain artistic choices and introduces certain central theoretical concepts that are essential to consider with regards to the aesthetic experience of the artwork.

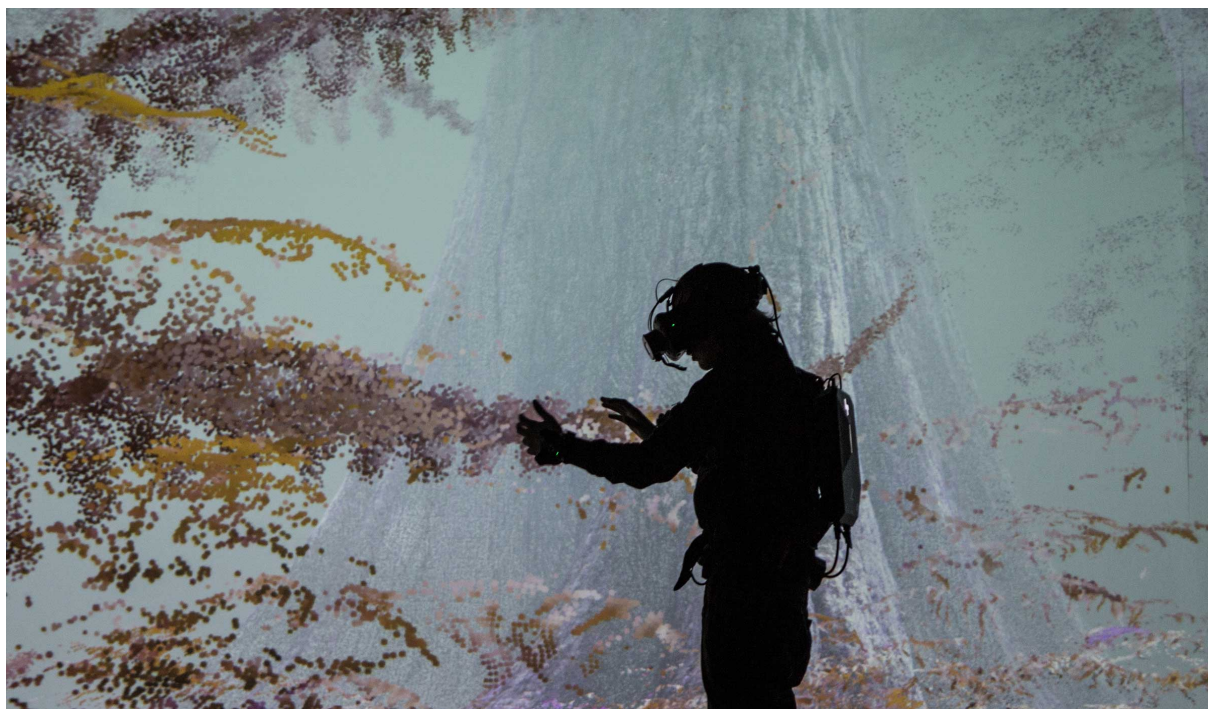


Figure 3. Interacting with the *Giant Sequoia* in VR – *We Live in an Ocean of Air*

Introducing the Central Concepts through the Guided Meditation

The online version of the VR project was introduced as an online guided breathing meditation, using a part of the visuals from the VR piece with a voice-over and occasionally appearing texts on screen. (*STRP festival*, 2020) The online guided meditation starts with a voice-over preparation. The audience is first asked to sit in a comfortable position, notice their surroundings and positioning within the environment. Then, the attention of the audience is brought to breath as the voice-over sound directs the breathing pattern of the audience, directing the participants to deeply inhale and exhale. As the audience follows the voice-over, the sounds of ocean waves synchronize with the rhythm of guided breathing exercise. For the most part, we hear a narrator alongside a voice-over.

The voice-over guides the audience to realize their situatedness within space, helping to build a bodily awareness in connection with the environment by bringing the audiences' attention to their breathing. The visuals accompany the rhythm of the breathing exercise as the audience is asked to imagine the oxygen flow within the body, as we are later on brought into witness an animated forest and trees with small particles moving and flowing across the screen. We hear the sound of the voice-over. It asks: "*Where does your body end and the plants begin?*" The narrator responds: "Your body is not limited and confined within your skin; it extends and expands through the planet. Air nurtures this connection."

Animated visuals appear and move throughout the presentation of the guided meditation. The narrator guides the thoughts of the audience with references to scientific information regarding the qualities and the flow of air between plants and animals. For instance, the narrator states the average number of breaths taken in a day and provides the audience with other numerical data on plants and breathing throughout the experience. As we continue, we learn that the name of the project is an ode to the work of Italian physicist Evangelista Torricelli. A student of Galileo, Torricelli's work on atmospheric pressure has led him to invent the barometer in the middle of the 17th century. The narrator voices his quote from 1644, "We live submerged at the bottom of an ocean of the element air."

The experience of the online presentation in the format of guided meditation with a breathing exercise complements the goal of the VR project in terms of realizing and attending

to the air flowing through the body within the environment. The vital link of air amongst us and other living organisms appears as a strong aspect of the narration. The artwork's focus on air effectively shows the interconnected web of relationships that humans are embedded within. As the audience is continued to be guided to follow the pattern of breath, the animation shifts with small particles appearing on the screen to give shape to red-brown colored transparent visuals of wooden tree trunks.

The narrator invites the audience to imagine themselves within a Californian redwood forest and informs the audience how the giant redwood trees in the Northern Americas are one of the oldest living organisms on the planet. *Giant Sequoia* trees are estimated to have been on the planet for around ten thousand years. "We are connected to these redwoods unknowingly thousands of times through breathing, yet this connection is invisible, and the cognitive dissonance comes from our inability to comprehend the scale of vegetal time. How does something get this big? How does a three thousand year old tree experience time? How does it feed and breathe?"

After being confronted with these questions, the animation starts moving with the flowing water patterns inside the tree. We now begin to witness, or to put it more accurately, we begin to imagine ourselves as part of the process of transpiration. The visuals carry our gaze as we move together with the water particles traveling from the tree roots and upwards through the leaves. At this step, we are asked to imagine dissolving into the air again, preparing to get ready for taking yet another life form. This time we are reminded of the countless numbers of insects, smaller organisms, fungi living at plant roots forming mycorrhizal networks under the soil.

As we dwell into the exercise, the narrator asks us to imagine seeing the world through the eyes of another being in the forest. "How do these organisms see the forest?" asks the narrator. Upon this question, we are now encouraged to imagine seeing through the eye of another being, as a spider that lives in the soil under the red-wood tree. The narrator reminds us that the spider *Pimosa Cthulhu* lives in the Californian redwoods, referring to Donna Haraway's *Cthulhucene*. The exercise begins building upon Haraway's spider web metaphor as a representation of the entangled co-presence of humans and other-than humans.

Visuals start to change as we are now brought to imagine experiencing the forest from the ground through a spider's eye. In parallel, German biologist Jakob von Uexküll's concept of *umwelt* is brought to our attention by the narrator. Although the notion of *umwelt* is only briefly mentioned during the guided meditation, it is a key term to make sense of the experience and the imaginative exercise provided by the artwork. This part of the exercise could be considered even as an ode to von Uexküll's 1934 paper in which he encouraged his readers to imagine an oak tree and the creatures that share the same environment. With his theory of *umwelt*, von Uexküll has suggested that a variety of inhabitants living in the same ecosystem have distinct modes of perceiving and sensing the same environment.

Jakob von Uexküll's *A Stroll Through the Worlds of Animals and Men: A Picture Book of Invisible Worlds* provides the reader a glimpse into the worlds of other animals, to the 'unfamiliar worlds' that remain not entirely familiar for the humans to grasp. The concept of *umwelt* is often associated with Uexküll's famous example of the tick, based on his studies on how various animals sense their environment. In his theory of *umwelt*, von Uexküll has separated animals as simple and complex beings based on their unique abilities to perceive the world. To exemplify, in the essay, von Uexküll introduces ticks as simple animals. Ticks do not have eyes, and they only respond to the warmth, light, and the stimulus of butyric acid, which is a compound found inside mammalian sweat. (Kirksey, 2010, p.19) According to the *umwelt* theory, the tick's response to these three compounds in its environment determines how the ticks perceive and experience the world around them.

After von Uexküll's introduction of the concept of *umwelt*, his theory has been adopted by philosophers and social scientists, especially with regards to phenomenology. In his book *The Perception of Environment*, Tim Ingold (2000) offers his opinions on how humans perceive their environment compared to nonhuman animals by paying attention specifically to human-made built environments as a way to count for how humans 'make' worlds. Building a home, building, and construction in the most literal sense can be considered a world-building activity following Ingold. Ingold (2000) approaches to *umwelt* concept by thinking through how humans perceive (built) environments in comparison to nonhuman animals, and he suggests, "We human beings cannot enter directly into the *umwelten* of other creatures, but through close study, we may be able to imagine what they are like." (p.176)

Supported through the capacity of the imagination, the close study of the *umwelten* of other creatures can involve a technological engagement with the object of the study. In his article, von Uexküll (1934) refers to the machines that extend our senses to help us understanding the world around us better as ‘perceptual tools’. Additionally, he refers to the tools that impact the purpose behind our action as ‘effector tools’. This distinction made by him is not mainly to my interest here. Nonetheless, it is also not von Uexküll’s goal to provide a theory regarding the function of technologies in modifying the human senses. However, his mention of perceptual tools which help the human senses in order to assist in understanding the world around us better might require closer attention with regards to the artwork.

von Uexküll (1934) mentions microphones and telescopes as tools that help our senses. (p.6) Through the engagement with a perceptual tools such as a telescope, the scientist can see the organisms or objects invisible to the human eye otherwise. While describing the *umwelt* of animals, von Uexküll talks about how different organisms experience the space around them based on tactile, visual and other sensory qualities. In the essay, he posits an image, a photograph of a village, to demonstrate his speculation on how the vision of a fly might look like. With this example, he visualizes how the fly would perceive its environment by offering an image from lens-based media, helping us to imagine what it would feel like to perceive the world from the sensory experience of another being.

“Human beings do not construct the world in a certain way by virtue of what they are, but by virtue of their conceptions of the possibilities of being. And these possibilities are limited only by the power of the imagination.” (Ingold, 2000, p.177). The capacity of imagination is required to relate to the -nonhuman- other as I have demonstrated in the first chapter. Technologies and artistic practices might play a role in facilitating to realize the other and perhaps empathize through assisting human senses and imagination. In the guided meditation, by expanding our imagination to meet with other ways of sensing the earth (e.g., spider, tree). We are guided to realize that the ways in which humans perceive the world is not the only, but rather one of many other different ways of perceiving and acting. In the guided meditation and within the VR version of the artwork, the concept of *umwelt* offers us a realization of the various capacities, including the technological ones, through which different subjectivities perceive the world in a unique way.



Figure 4. Interacting with the *Giant Sequoia* in VR – *We Live in an Ocean of Air*

VR experience of the artwork

In *We Live in an Ocean of Air*, virtual reality technology allows the audience to see the invisible connections amongst humans and nonhumans; the technology is utilized to tell the story of plants by providing an immersive experience to the audience. The VR version of the art project *We Live in an Ocean of Air* takes place as an on-site collaborative experience. The experience takes about twenty minutes in total with the participation of twelve people as a group at the same time. As I have mentioned earlier, for the analysis of the VR experience, I will rely on found data of recipient observations, blogposts, and artwork reviews. Upon entering the art gallery, the visitors have noted to arrive in a dark room with screens. Before starting the experience, the audience is given heavy equipment with VR headsets, sensors, and monitors in order to track the bodily responses of the audience. Remarkably, some part of the audience has noted that the pieces of the VR equipment and monitors have reminded them of scuba diver clothes as if they were getting ready to breathe inside the water.

"For me, it felt as if I was a scuba diver again: immersed and levitating, looking at bubbles of air filling the space around me, wearing heavy and complex technology like a second skin..." (Segreto, 2019)

The VR experience starts with a breathing exercise, similar to the online guided meditation. The visualization of air particles accompanies the breathing patterns generated within the VR environment. With the tracking sensors on the equipment, the participant's flow of breath and the breathing patterns of other participants are visualized in the VR environment. As the participants delve more into the experience and once they begin to get used to the heavy technological equipment, the experience of the virtual world is transformed, guiding the audience inside to a forest. Recipients have noted that after adjusting to the VR environment, the heavy technological equipment is forgotten, and the movements become more comfortable. The visualization of air particles' flow coordinated to the recipients' breathing pattern has been noted to provide a sense of freedom.

"As the forest materializes, the electronic apparatus is soon forgotten – or at least the emotional participation allows you to ignore their presence for almost as long as the VR experience –" (Segreto, 2019)

Once the participants get more familiar with the environment, they are invited to 'enter' inside a *Sequoia* tree. The *Giant Sequoia* is an ancient tree, one of the oldest and largest living organisms under a threat of extinction. In the meditation, we were asked to imagine going inside the tree as we kept imagining breathing together with the plant. In the VR experience, the participants connect to the tree with their bodily movements and breath. As Kwastek (2011) notes, the use of VR technology often leads to controversies around issues of disembodiment, accompanied by the highly debated distinctions between the virtual and the real. The physical experience and the interaction in the virtual reality technology, as she notes, is often preferred by the artists as it heightens bodily awareness. To discuss how the VR artworks place the body at the center of the interactive experiences, Kwastek gives an example of Char Davies's virtual reality art piece *Osmose* from 1995, where the audience can control the immersive environment through their breathing roaming inside of a forest. We encounter a very similar motive behind *We Live in an Ocean of Air*, where the participants are made aware of their corporeal presence within the coded VR environment through their breath and movements in the museum space.

The use of VR technology in the artwork aims to make participants better aware of other sensibilities and notice other ways of being on earth and interspecies relations. Here, the cyborg

concept might better help us consider how technologies alter specific physical capacities to provide new sensorial experiences and sensitivities. In the second chapter, we have seen how the cyborg has challenged the view of an isolated body by introducing the body as a hybrid together with the merge of the organism and technology. Through the multisensory VR experience provided by the artwork, the *umwelt* of the body is aimed to be extended with the immersive experience provided through virtual reality. Sensory augmentation assured with the use of VR technology assists the imaginative experience provided the project, guiding the audience through the information about plants, air, and breath. Breathing appears as a vehicle, and the artwork guides the imagination of the audience as a means to support an interconnected trail of thinking and being, stimulating the effort for relating to the (nonhuman) Other.

From a posthuman point of view, the concept of *umwelt* is considered an analytical framework to explain how the perceptual abilities of the body can be extended with the inclusion of sensory technologies. (Kadlecova, Krbec, 2020) The use of virtual reality technology in artworks attracted attention together with the discussions of interactivity in the experience of artworks transformed by computer technology. Technological implants, sensory devices, computers can be considered cyborg technologies. It may not be possible to gain a direct insight into the *umwelt* of another organism, as von Uexküll suggests. However, the potential of changing the sensory experience or perceptual world through technologies are explored as ways to "extend the experiential world" (p. 187) and could further sustain the imaginative activity of the spectator by providing a closer sensorial insight into the "experiential world of other species and life-forms." (p.189) The latter suggestion especially is in line with the artistic aim of the virtual reality experience offered by *We Live in an Ocean of Air*.

It is worth mentioning that artists since the 60s have been experimenting with technologies and exploring the possibilities for expanding sensorial experiences. Contemporary cyborg artists such as Moon Ribas and Neil Harbisson, founders of the "Cyborg Foundation," have been advocating for cyborg rights and exploring the creative, artistic potentialities of being a cyborg. With the help of a technological implant inside her arm, Ribas can feel seismic activities, while Harbisson can perceive colors outside of the perceivable color spectrum with the help of a special camera placed inside his skull. According to Harbisson and Ribas, these technological sensorial enhancements help them relate to the world differently by allowing them to tap into a different mode of perceptual experience. Notably, the artists claim that the sensory enhancements bring them closer to perceptual experiences of other species,

strengthening their empathic abilities and connection to the earth. From this perspective, as Glabau (2017) suggests, the use of cyborg technologies can help to find "a sense of kinship with nonhumans,"(para.14) yet, the use of technologies for sensory enhancement also bears the risk of giving rise to other forms of exclusion, one apparent reason being the inequality of access to such technologies.

As I have discussed so far, the central goal of the VR experience is to encourage the audience to recognize the vital relationship between animals and plants. In this regard, symbiosis, or the symbiotic relationship between plants and animals, come across as another essential aspect that the artwork brings to the table. The inability to conceive our deep relation to plants and our cohabitation of the world comes from cognitive dissonance is caused by the limits of our perceptual abilities, as mentioned during the guided meditation by the narrator. By visualizing the co-dependent relation between animal and the plant, artists of the project have highlighted the form of symbiotic relationship focusing on the attributes of air circulation during photosynthesis.

As Haraway notes in *Staying with the Trouble*, Darwin's *On the Origin of the Species* (1859) has radically impacted our ability to think, feel, and act well since it was introduced. (Haraway, 2016, p. 62) The "New Synthesis" theory, developed in the 1930s and 1940s, has introduced genetic knowledge into the theory of evolution. Thus, "New Synthesis", or "the Modern Synthesis" theory has helped to explain the theory of evolution together with the elements of genetic variation. Feminist scholars, including Donna Haraway, have pointed out that this interpretation of evolution, accompanied by the theories of Social Darwinism, has presented a singular, selective story of evolution. Haraway (2016) suggests that although mathematically described elements of relationalities that The New Synthesis theory considers with the study of organisms, genes, cells, and ecosystems; the "story formats" within this paradigm does not seem to allow any space for anything other than explaining relations based on competition. In this regard, she adds:

"Rooted in units and relations, especially competitive relations, the sciences of the Modern Synthesis, for example, population genetics, have a hard time with four key biological domains: embryology and development, symbiosis and collaborative entanglements of holobionts and holobiomes, the vast worldings of microbes, and exuberant critter biobehavioral inter-and intra-actions." (Haraway, 2016, p.62)

Haraway also mentions the role of collaborative work of artists and scientists in highlighting other aspects of the understanding of evolutionary sciences and shedding light upon other aspects of natural-cultural relationships than competition, success, or fitness. As I have discussed in the second chapter, contrary to the linear stories of progress and evolution, feminist SF practices aim to create stories and alternative narratives that embrace the complexity and messiness of lived experiences and interspecies relations. The focus of the artwork on the symbiotic relationship between animal and the plant, with a simple yet effective focus on air, supports this underlying framework which we have explored through the analysis of feminist SF practices.

"The sciences of the Anthropocene are too much contained within restrictive systems theories and within evolutionary theories called the Modern Synthesis, which for all their extraordinary importance have proven unable to think well about sympoiesis, symbiosis, symbiogenesis, development, webbed ecologies, and microbes. That's a lot of trouble for adequate evolutionary theory." (Haraway, 2016, p. 62)

Imagining how trees experience the forest with the connections they form with their surroundings through fungi networks, the artwork tells the story of the plants and other forms of being living in the forest. The experience provided by the artwork leads the audience's imagination to experience the forest created in VR while placing the body as a connection that generates the flow of breath. The artwork demonstrates how our bodies are not confined but expand with our surroundings. It offers an experience that aims to make the audience aware of entangled relationships by drawing attention to one of the most basic yet fundamental connections we have with the earth. Air is emphasized as the invisible link, a trail that ties us to another being. Animal-plant boundaries, the boundaries of the human body dissolve through the link of air. The artwork is not a proposal for the future, but it can be considered the training of the attention to be in the present, an aspect that comes forward, primarily through the guided meditation.

Critical Observations on the Aesthetic Interaction, Situating the Artwork within a Broader Cultural, Artistic Discourse

As the title suggests, my goal in this section is to position the VR artwork within a broader artistic and cultural context within contemporary creative approaches to the Anthropocene. I will build upon some of my critical observations that come to the fore through the close study of the aesthetic experience provided by the art project in the context of the ideas presented through feminist SF.

I- De-centralizing the Human?

A growing interest in re-configuring the human and nonhuman relations in the contemporary artistic approaches stems from various intersected sociocultural phenomena, from the proliferation of cybernetic technologies to the contemporary crises introduced through the extractive petroc capitalist processes such as the growing threats of biodiversity loss and ecosystems degradation. These developments have been accompanied by various 'turns' in thinking and practice such as the ontological, nonhuman, more-than-human. These developments had substantial influences on artistic and creative approaches to the Anthropocene. The contemporary crises of the twenty-first century motives artists to engage nonhuman forces to question the imbalanced power dynamics between humans and other-than-human animals, interspecies relations in much of the contemporary ecological and environmental art.

A recurring conceptual theme within the current paradigms of environmental art is represented with the term more-than-human, emerging across arts and design fields.¹³ The term Westerlaken (2020) notes covers various approaches that "challenge anthropocentric ideas and aim to indicate that much more is happening 'beyond the human' focus." (p.14) Starting from the first chapter, I have exemplified some relevant creative and scientific practices by drawing on the role of imagination in relating to the (nonhuman) Other, which is a fundamentally

¹³ In *Participatory Research in More than Human Worlds* (2016), the authors put forward the methodological engagements of pursuing a more-than-human approach within social sciences and humanities research. More than human research is explained as "research that has sought – in one way or another – to take nonhuman life, and the entanglements of human/nonhuman life, seriously and to this step away from the modernist dismissal of nature and nonhumans as anything but resources." (p.2)

empathic effort. A seemingly less mentioned or neglected logical gap that emerges from some of the contemporary more-than-human approaches in arts and humanities breaks out from the wish of de-centering the human by placing the human experience to the center.

As we have seen in the second chapter, feminist SF realizes the origins of the stories that give a lead to ideas such as human exceptionalism. Emphasizing the co-dependent relationship between humans and plants, (a connection that human is perhaps more dependent upon) as noted in an interview with the artists (Voices of VR, 2020), the art project *We Live in an Ocean of Air* aims to overcome a human-centered mode of sensing the world. Still, it is essential to note that even though the artwork seeks to decentralize the human, the experience is still limited to the perceptive abilities of a human recipient despite the perceptive experience can be altered and expanded with sensory technologies. The question of decentralizing the human through the more-than-human artistic approaches remain an ambiguous one. While artistic projects aim to offer audiences experiences that encourage the realization of interconnected relations, it seems that these approaches fall into the trap of placing the nonhuman as the other from a human point of view.¹⁴ This point comes with bearing the questions of agency and presents a broader challenge or limitation to the more-than-human approaches in research and art practice.

Donna Haraway's metaphor of a spider web works within the artwork as a way of realizing our situatedness of being involved in a mesh of relations inside a 'more-than-human world. Brought to imagine the forest in the eye of a spider, the artwork aims to cultivate empathy with an other-than-human being in the virtual reality environment. The spider web metaphor within the experience of the VR piece provides an extension to our imaginative abilities to relate to other beings; however, does it cultivate empathy for another being, or even further, could it help build a sense of care for another being? Differences in personal aesthetic experience would impact how we should address this question, yet elaborating on a related example could provide us with more insight. A similar approach can be found in gaming environments, where the player takes the perspective of another being, and 'plays' the environment from the "a first-or second-person/ animal perspective" (Chang, 2019, p.110)

¹⁴ To address these limitations we could ask how to reclaim a damaged world for other-than human beings? What kind of methodological encounters this question would entail without further contributing to the othering of nonhumans?

The author of *Playing the Nature* (2019), Alenda Y. Chang, analyzes the nonhuman elements within gameplay by elaborating upon the digitally mediated animal-human-nonhuman relations. With the introduction of VR in gaming environments, some of the games that Chang (2019) mentions, such as *Birdly*, allows the gamer to experience a flight of a bird via a flight simulation, while other games experiment with the player agency by emphasizing the nonhuman animal's perspective over the player's within the gaming environment. (p.112) She proposes that the animals within the gaming environment 'occupy a liminal space' and that nurturing for a nonhuman animal within the play can support developing a feeling of care.¹⁵ However, it is essential to note that the model of engagement in the gaming examples she provides actively demands the gamer's attention to nurturing another nonhuman being as part of the rule of play. In the case of the artwork, this demand appears somewhat looser as the artwork encourages the audience to notice the link of air by guiding the audience to predominantly focus on their breathing patterns to build a connection with the plants in the virtual reality environment.

Chang (2019) expands her analysis on the representations of animals in games to plants by focusing on the rendering techniques, graphics, and other elements of design. Some intriguing factors that she mentions in games and the representation of plants within gaming environments are the tension between computational power, graphics capabilities, and botanical accuracy. With the current developments in the 3D rendering abilities of computational systems, designers can reflect nonhuman characteristics with more precision. The consideration of the accurate mimicry of the natural elements within gaming environments comes together with evaluating the conditions that render these developments possible.

Chang discusses, for instance, less paid attention parts of the game industry, where the interest in the history and development of software and platforms seem to be the dominant issues of concern while less attention has been paid to the "'middleware' realm of game tools, engines, software development kits (SDKs), and asset libraries." (2019) The use of digital asset libraries for the development of gaming environments appears to function on market dynamics

¹⁵ Chang (2019) references sociologist Sherry Turkle's work. Turkle, in her research, has delved into different aspects of the relationship with "machine others," such as companion robot dogs. To exemplify the affection felt for the machine other, Chang (2019) points out Turkle's example of how children care for a toy creature or a machine friend such as *Furby* or *Tamagotchi*. (p.113)

that are based on high prices and profit-making. "If you wish to buy digital trees from the French company *Bionatics*, for instance, expect to spend hundreds, if not thousands of dollars" (Chang, 2019, p. 122). Much of what Chang observes with regards to the gaming industry holds its relevance for other domains within the cultural industry; it deeply concerns much of the art and technology collaborations in the contemporary art world as artists and galleries enthusiastically develop programs to explore and experiment with the newest technologies. An unseen danger within these approaches is deeply connected to what Chang (2019) points out through the example of digital asset libraries ingrained within the 'sorry' anthropocentric bias observed in most cultural production. (p.122)

The cyborg figuration of feminist SF once again comes to the fore through these observations. With regards to the case of *We Live in an Ocean of Air*, the cyborg not only becomes an essential figure of relating to the other by imaginative, technological sensorial enhancements but together with the consideration of the artwork within the dynamics of contemporary cultural production, it reflects a more critical reality of techno-capitalist, military-industrial expansion on artistic practices. This point brings me to my following critical observation on aesthetics and abstraction, narratives of progress, and material realities that art and technology collaborations embody.

II- Abstraction, Narratives of Progress and Material Implications of the Artwork

In the example of *We Live in an Ocean of Air*, the artwork has a critical aim in emphasizing the interconnected relationships of animal and plant species by mobilizing the audience's imagination to establish a form of empathy and a perceptual connection between other forms of existence. A recurring, popular discourse in various circles, in academia as well as in the cultural sector, comes with much excitement around the potentials of technologies such as VR to 'do good' or reconnect humans with 'nature.' (Segreto, 2019). A less addressed aspect within such discourses, however, is the operation of these projects within the same extractive framework of production and consumption patterns. In an interview with the artists, that took place in the online version of the *Node Festival* (2020), the material impact of the artwork has only been briefly discussed with the production team of the artwork.¹⁶

¹⁶ It is specified in the presentation that since the artwork "talks about the wonders of the natural world" (*Node Festival*, 2020), it had to be conscious of the material impact. In the presentation, "matters of

Artists and production teams shy away from addressing the material implications of the artworks, while museums and curators knowingly or unknowingly get caught up within the linear narratives of progress. The focus on the ‘revolutionary’, or ‘novel’ aspects of using technologies for artistic purposes creates an illusionary progress in the intersections of arts and technoscience. This illusion is present within art, technology, and science, accompanied by a mode of confidence, a self-belief that blurs out the vision for other possible, unexpected outcomes. This condition is marked with a kind of internalized belief as if everything is going to work according to a plan, as if ‘nature’ will somehow cooperate. According to this point, Rick Dolphijn (2021), in a short article, explains how developments in modern arts and sciences block our recognition through creating a kind of alienation, an *unearthing*.

“...packed with ‘revolutions’ in art and ‘discoveries’ in science, the advances of modernity have made us so self-confident, so completely trusting in efficiency and profit, that we find it unimaginable or unthinkable that the earth might very well, all of a sudden, act very differently from how we imagined it would. This blindness would have started in the early 19th century, the time when modernity radically renewed our ideas of science, technology, and art.”

(Artez, 2021, para. 16)

As mentioned earlier in the previous section, through the example of the gaming environments, rendering 3D image technologies allows for a more accurate representation of plants in a computer environment. Chang (2019), in her analysis on gaming environments, delve into technical, modelling aspects of digitally generated plants.¹⁷ As the accuracy of the rendering and design is altered for our improved perceptual understanding of the digitally created plants, these representations increasingly become the “’ nature’ that we increasingly consume on our screens, that is praised by industry elites, and in some cases, as

sustainability” were touched upon; however, the question was mainly addressed in the scope of financial sustainability, although there had been a mention of electric usage planning. It is perhaps helpful to note that the term sustainability is brought to attention for being a destructive oxymoron by ecologists for perpetuating the same logic of sustaining economic growth. (Chang, 2019, p.171)

¹⁷ Chang (2019) mentions several companies that have been specialized in rendering plants and visual effects for gaming, one of them being *SpeedTree* which has worked on films, including *Avatar* by James Cameron. The company offers a collection of digitally rendered plants and has crossed many platforms from architecture to games and cinema. On an additional note, Chang (2019) points out to companies’ partial connections to the military, as the company’s founders have developed their technical skills while serving in the navy. (p.123)

with *Avatar*'s Pandora, found preferable to our own world.” (Chang, 2019, p.123) *We Live in an Ocean of Air* presents an accurate example; together with the modelling of plants as a collection of oxygen particles, the artwork experiments with an abstract representation of trees and other plants in VR environment.

With its focus on air and breathing, the VR artwork experience is noted to have a meditative aspect to it. According to a recipient observation, for example, the VR experience provides an escape from the busy city life, “nice abstraction makes you conscious of your breathing (a good way to relax) but is also very beautiful, like floating confetti or sand.” (Gillies, 2019) Another recipient strikingly observes, “It feels like a fantasy world – like being transported into James Cameron’s *Avatar*. It shows how, in a short space of time, VR technology has developed: in this scenario, it provides an innovative, playful and entertaining experience.” (Oakes, 2019) The coded VR environment intends to create a multisensory immersion into the virtual world, together with other sensory enhancements such as smell¹⁸. The notes from recipient observations point out a heightened sensitivity to the visualizations and other sensory alterations. The representation of plants, and other elements of forest ecology, brings with it the question of whether the aesthetic experience of the artwork creates an abstraction from lived experience.

The abstraction of plants and altered senses such as smell and a heightened sense of color create a dream-like sequence, a look into a kind of “fantasy world,” as some recipients note upon their experience of the project. (Huang Medium, 2019; Oakes, 2019) Aside from supporting the audience’s imagination to relate other subjectivities, the escapism provided by the experience with the abstracted visuals of plants might also lead to alienation or distraction from the critical aspects of our relationship with plants. While this is a crucial awareness in the current conditions of global ecological crisis and climate emergency, the experience offered by the art project does not directly build a connection to the contemporary crises. It is most probably left to the audience to build this connection. However, it is also necessary to point out, especially since the artwork tries to reveal our co-dependent relationship with plants at a time when more than half of the plant species are under the threat of extinction.

¹⁸ In the interview with the artists (*Node Festival*, 2020), it is specified that woody and earthy scents are used throughout the experience to support immersiveness with more sensory guidance and enhancement.

Abstractions are inherent to petrocapitalism and its aesthetic extensions within everyday experience. The abstractions from lived experiences, from “on-the-ground” phenomena, climate change, economic crises have sociopolitical, scientific, and artistic dimensions. As we increasingly make sense of a *hyperobject*¹⁹ such as climate change through our models of technological mediation (Williams, 2014, p.54), we seem to encounter a paradox through the processes that lead to abstraction.²⁰ The apparent visual abstraction created through the spectacle of the VR art piece might contribute to what Ben Woodard (2014) refers to as a cute ecology.²¹ In terms of the experience of the artwork, it may also appear as a way of creating sympathy or affectivity through an aesthetic appeal. The creation of sympathy comes at a price of epistemology, according to Woodard. The perceptual understanding created with affectivity has peculiar consequences for determining what counts as ‘nature’ (e.g., what is worth to be saved), broadening a gap of ‘cute-noncute’, especially becomes apparent through the example of nonhuman animals. Furthermore, within this paradigm, the critical material production is easily let out of consideration. (p.107)

Chang (2019) asserts with regards to gaming, “In our critical attention to games as texts, narratives, worlds, or sites of player experience, it is all too easy to take their material provenance for granted.” (p.148) This observation on games is present within the appraisal of artistic projects. Creation of the virtual experience, artwork’s approach to its conceptual framework by incorporating different artistic elements and technologies attract more attention than the material sources that allow the creation of the experience possible. Here, the cyborg figure contributes to imagining a possibility for emancipatory potential around technologies and presents a more urgent, critical material reality. To reiterate, the irony of the cyborg comes

¹⁹ Timothy Morton uses the term *hyperobject* to describe phenomena such as climate change. “*Hyperobjects* are phenomena like radioactive materials and global warming. *Hyperobjects* stretch our ideas of time and space since they far outlast most human time scales, or they’re massively distributed in terrestrial space and so are unavailable to immediate experience.” (Jain, 2020, February 19)

²⁰ “We have abstractions which arise from real material systems, as well as abstractions which have real effects on such systems.” (Williams, 2014, p.54) If we consider the example of the artwork, the two seem interrelated. In this case, the abstraction that arises from the material reality of the artwork leads to an abstraction on a cognitive-behavioral level, which generates processes that feeds back into the social, material systems and structures.

²¹ ‘Cute ecology’, according to Woodard, aligns with greenwashing practices of the capital to make capitalism more compatible with ecology. He discusses, for example, how superficial changes in the consumption patterns in the Western world provide only “some account of ecological stability.” In relation to this point, Woodard mentions the distinction of cute and non-cute, referring to Timothy Morton’s work on aesthetics and nature.

from a critique for its own roots in the military-industrial complex. However, the criticism of techno-capital expansion and its intrinsic material urgencies reflected through the cyborg figuration remains a less acknowledged aspect within the artistic discourse. As more artists experiment with the creative potentials of digital technologies, issues such as disposal of e-waste, mining of precious metals and minerals for mechanical and technical production, and energy consumption remain in the background at the expense of creating spectacular imagery.

III- Human/Nonhuman Entanglements

As I have pointed out earlier, together with the cyborg figuration, emphasis on human-nonhuman entanglements and narratives of interconnection has become popular across humanities and the social sciences, with the efforts around dissolving the long-made dichotomies made between nature and culture. Stimulating a recognition of interconnectedness might be considered one step in the way of building an awareness beyond a human-centered way of imagining the world. However, a mode of disengagement with the ethical, material dimensions of complex relationalities is created through an overpowering emphasis on the narratives of entanglements.

We Live in an Ocean of Air places air to the center of the aesthetic experience, emphasizing its fundamental role in our connection to plants. Air provides a connection so mundane for us yet essential to our life, and it can be thought of as a ‘beautiful’ or ‘magnificent’ aspect of our existence, as the artwork highlights. However, air can also be fatal under the increasingly extreme pollution levels. In this regard, Rick Dolphijn (2021) reminds us of Amitav Gosh’s (2016) emphasis on air in his book *The Great Derangement*. (ArtEZ, para. 3) In his book, Gosh specifies that air pollution causes one in every six deaths globally, yet the hostile changes in the air quality remain unrecognized. (2016, p.10) The ‘translated’ scientific information in the immersive experience allows the audience to witness a limited story of air between plants and us.

The artwork experiments with VR technology and uses it with a creative goal to enhance human sensory capabilities to guide the recipient to recognize entangled interspecies relationships. As the artwork focuses on emphasizing our critical relationships to the nonhuman species, it also lacks in addressing the dangerous aspects of our relations with nonhuman forces

while amplifying a feeling of wonder or awe for the most part. Thinking together with this example of the artwork, we reach a more complex issue that concerns artistic practices and research that aim to go beyond anthropocentrism.

As feminist media scholar Eva Haifa Giraud (2019) suggests, the commonplace narratives around human and nonhuman entanglements tend to risk presenting a limited approach by leaving out the considerations of complex ethical and moral implications influenced by certain specificities within these relations. Her argument does not deny the complex relations we are embedded in; it aims to ask what happens after human and nonhuman entanglements are acknowledged. For instance, her argument signifies the attention that should be paid to the constitutive roles of exclusion. Entanglement and interconnectedness can become an ultimate narrative that leaves out and flattens the particularities of human and nonhuman relations. In this vein, it seems necessary to ask, following Giraud, “what happens beyond entanglement?” Asking this question, we can also go beyond the feeling of awe that goes along with the narratives of entanglement.

For the setup of *We live in an Ocean of Air*, the project team has collaborated with the London-based gallery and museum space Saatchi Gallery. This was a strategic choice to meet with a larger spectrum of audience based on the public reach statistics of the gallery. (*Node Festival*, 2020) Still, we can say that the on-site VR experience of the artwork meets with a specific audience in a Western context. This may reflect an important factor in considering how the geographical differences influence the mode of urgencies surrounding the pollution levels and climate crisis. Returning to Dolphijn’s (2021) observations on Ghosh’s *The Great Derangement*, he explains how living in Western Europe has impacted his views on air pollution levels. Dolphijn asserts:

“The polluting industries that dominate the economy here, such as agriculture and the petrochemical industries in the harbour, have definitely had a detrimental effect on my environment: polluting, exhausting, suffocating both the earth and the air. But the wind and the water have, until now, been able to wash much of this pollution away (as in, it transported it to less fortunate places)– at least, from our human perspective.” (ArtEZ, para. 4)

In terms of a *hyperobject* such as climate change, the multiplicity and difference of experiences (e.g., for ‘the developed’, Western parts of the world) create dissonance for the ability to grasp that these changes are happening all at the same time, no matter how it appears to be delayed in some kind of distant future. Above all, through the cyborg, we were able to point out the complexity of *naturalcultural* relations. The cyborg goes beyond a limited narrative of entanglement by making apparent the more ‘dangerous’, dubious, even neglected sides of human-nonhuman entanglements. It presents an irony ingrained within the contemporary cultural production, using cyborg technologies to create ‘liberating’ experiences despite their unforeseen consequences.



Figure 5. Image from *Metamorphosis* by the *Institute of Queer Ecology*

Metamorphosis

Metamorphosis is a video series project from artist and researcher collective, *The Institute of Queer Ecology (IQECO)*. The video series takes place in four parts, including the introduction part of the film. In each part, a critique of the current world-system is made by thinking through the insights gathered from research in sociology, natural sciences, ecology, and biology. The parts of the video series are organized based on the transformational stages of metamorphosis. The sequence corresponds to the larva, pupa, imago(adult) stages. According to the website of *IQECO*, the project is introduced as a proposal “to restructure how the world is imagined and how it operates today... the organism fully restructures itself to adapt to its changing needs and ensure its survival.” For the analysis of the video series, I will focus on the content, the narration style, the choices of visual communication, and interview with the artists by conducting an interpretative evaluation of the artwork within the scope of feminist SF and the critical role of the imagination. The analysis will follow the stages of the metamorphosis, structured after the parts of the video series. I will start by engaging the content of the separate video parts to form connections with the modes of criticism that I have covered in the second chapter through the lens of feminist SF. The film, especially in the first parts, is narrated in a didactic style and offers a systematic criticism of the historical and economic processes hidden behind the current socio-ecological crisis that we are currently facing. The style of narration

Starting from telling the story of the beginnings of life on Earth and later on, bringing the focus to the current drastic changes in the atmosphere by mentioning climate events, the narrator captures the spectator's attention by establishing a sense of familiarity with the storyline. We quickly understand that the aim of the film is not only to bring attention to the destructive events that are happening as a consequence of the climatic changes; the goal is not to sustain a narrative of an apocalypse. Instead, it becomes apparent that the film makes more substantial connections to the hidden historical and social processes and critiques the hegemonic relations that underlie the ongoing planetary ecological crisis. We are brought into the realization that during the wildfires in California, while the big companies created private fire departments for their customers living in villas and big mansions, while firefighters were paid less than two dollars a day. This example signals a critique of a broader dynamic of exploitation, socioeconomic inequality, and exploitation that the film emphasizes and attempts to offer an alternative.

On the other hand, in the Amazon, the fires are not due to occasional lightning strikes, but due to land clearing activities to open up more land for farming activities which will primarily benefit multinational corporations. The narrator of the video, Orlowski, adds: "Fire may be one of humanity's oldest technologies, but in the Amazon, it has been weaponized for colonial genocide and ecocide. When the Amazon burns, colonialism is bearing its teeth through flames." In contrast to wildfires, the next scene is followed by footage of flooding followed by an extravagant display of *Bellagio Fountains* in Las Vegas, a small depiction of the industrial colonialism operating at the margins of cultural capital exploitation. The opening part is short yet comprehensive in bringing a ground for the construction of the proposal. It starts with a coherent depiction of events of the socioecological crisis that has made a significant mark in the collective consciousness while highlighting the less apparent dynamics of socioeconomic inequalities ingrained within the disastrous results caused by the processes that gave a lead to large-scale climate change.

The end of the introduction signals the beginnings of a possibility of transformation that could emerge from times of crisis. As companies and the industry try to create their modes of directing the market by appropriating their 'green' solutions and contributing to a doomsday economy while widening socioeconomic inequality. The narrator emphasizes a need for finding other resilient economic relations. Inspiration for the possibility of finding resistance and adaptation to the crisis comes with an example of *pyrophyte plants*.

On an interesting note, as we can recall from the previous case study, a member of this kind of tree is the *Giant Sequoia*. *Pyrophyte plants* show high adaptability to fires; in fact, some of these plants need fire for reproduction. Presented to us at the end of the introduction video, the example of *pyrophyte plants* sets a more optimistic tone for a possibility of change that the film signalizes through the metaphor of metamorphosis.

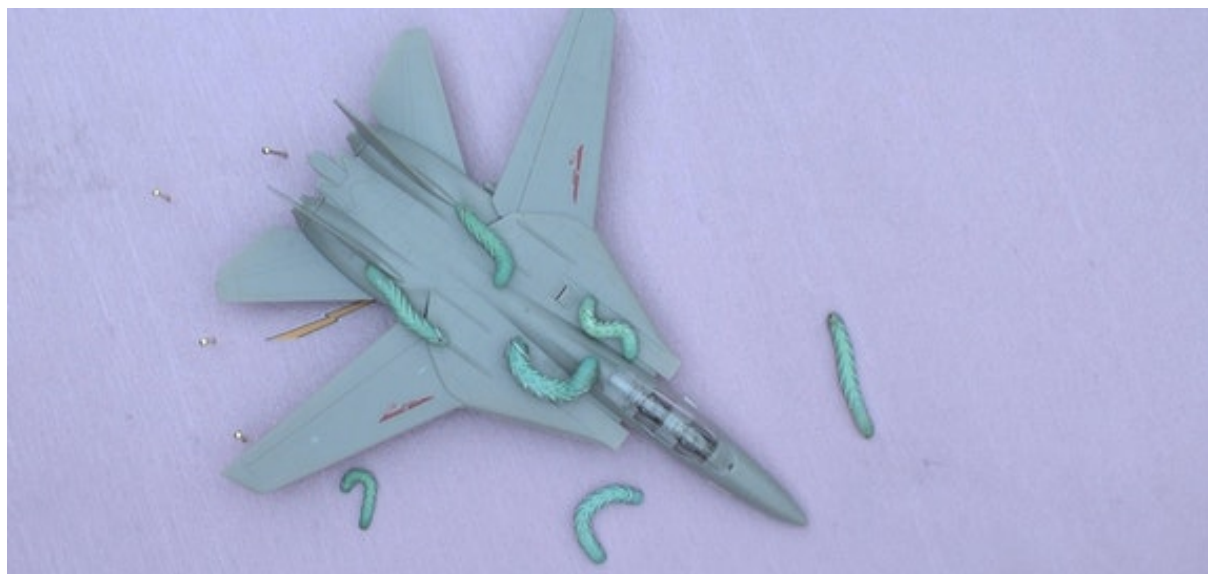


Figure 7. *Grub Economics* by *The Institute of Queer Ecology*

Larva Stage (*Grub Economics*)

The first part of the video series built upon the characteristics of the larva stage after the first part of a metamorphosis. Titled *Grub Economics*, the video covers some of the influential scientific conceptions on how the earth systems function and further builds similarities between the larva stage of metamorphosis and the capitalist economy. An essential connection to feminist SF that I have covered in the second chapter is the realization of science as a social construct and its role in shaping certain popular beliefs and worldviews. The example film provides concerns the beginnings of the science of ecology. This example will be essential for us to cover in order to see how the film recognizes and attempts at transforming the popular narratives put forward by particular social actors (scientists, economists, industries) following their specific agendas, which I have covered as part of the theoretical framework of feminist SF practices in the second chapter. The narrator informs the spectator that ecology is a relatively new science, and in its beginnings, has dissected a belief of the planet as a self-regulating

system. The scientific conception in question in this part of the film is stated as the balance of nature theory.

The narrator mentions the class dynamics, and social factors influential in shaping scientific ideas, by acknowledging the storytelling techniques employed by the ruling class and scientists. The film demonstrates this point, especially by focusing on the ideas put forward by early ecologists. The balance of the nature theory assumed that the planet would operate as a self-renewing system; no matter the intensity of the expansive activities of market economy and exploitation of land, the theory assumed that the 'nature' would renew itself. As we know, in the 80s, however, the belief in the balance of the nature theory was challenged. After centuries of human exceptionalism and the narcissism of 'Man,' "Gaia," named after James Lovelock's hypothesis of planetary-scale homeostasis²², started to 'intrude,' after Isabelle Stenger's (2004) framing of the notion. Stengers (2004) have appropriated the term, maintaining its connection to Lovelock's theory, in order to point out that the views of earth as a stable system. "We are no longer dealing (only) with a wild and threatening nature, nor with a fragile nature to be protected, nor a nature to be mercilessly exploited." (p. 46) Similar to the incomplete reading of Darwin's theory of evolution, the balance of nature theory has "a history of being warped by powerful people into proof that everything, from climate to class struggles may experience slight changes but eventually will be corrected to status-quo," the narrator asserts.

In the film, we see that the association between capitalist industries and the larva stage of grubs is made based on excessive consumption habits of the organism. At the larva stage of metamorphosis, the caterpillar consumes food to store later to be used in the adult form. Capitalists are portrayed similarly to a caterpillar; to grow, they consume and feed on earth's resources. As capitalists do not want to give up their expansive activities to find new resources, climate change causes a problem they imminently want to solve. As we have covered in the previous chapter, multinational corporations develop technological solutions to deal with the complex issues of climate change by undertaking geoengineering projects. Corporations perform these technoscientific projects as part of their pursuit for a better future when the actual

²² Homeostasis can be best described as "the state of steady internal, physical, and chemical conditions maintained by living systems." (Britannica, T. Editors of Encyclopaedia (2020, May 27)

reason behind their enthusiasm for finding quick fixes is to maintain their present-day endeavors to continue to make profits as much as possible.

Metamorphosis directs our attention to the same issue by detailing geoengineering projects' premises by providing a detailed example from climate cooling projects and their possible consequences. Climate cooling geoengineering projects are discussed seriously by government agencies and scientists. The narrator Mykki Blanco points out these projects as examples of quick fixes that aim to solve the warming of the climate. A less mentioned aspect of geoengineering projects in the popular scientific narrative is the possibility of more permanent changes in the atmosphere; the consequences that would arise with the implementation of the climate cooling projects would be distributed unequally and would impact non-human species in an unprecedented way. Blanco mentions the possibility of a haze of fog that may emerge due to the climate cooling project. The fog could potentially blur our vision, Blanco asserts, cover the possibility for seeing the skies, and for expanding our horizons to imagine other futures.

Pupa Stage (*Liquidation*)

Liquidation, the second part of the proposal, is named with an economic association to reference the caterpillar's pupa life stage. Before entering their cocoon holometabolous insects²³, release enzymes to dissolve bodily structures. They 'liquidify' themselves to emerge from the cocoon at the end of the transformation. In the first stage of the transformation, as a grub, the organism mostly consumes. Therefore film establishes an affinity with the accumulation of capital under the system of extractive petrocapiatalism. Capitalism is given a palpable figure in this stage of the metamorphosis in the proposal, getting ready to be transformed, figuratively.

Imago Stage (*Emergence*)

The Imago stage is the last part of metamorphosis where the organism emerges from the cocoon, for instance, as a moth or a butterfly. At this last stage, where capitalism transforms speculatively, a powerful connection is made by mentioning a popular culture figure. *Mothra*,

²³ *Holometabolous* denote insects that go through complete stages of metamorphosis.

a monster from the *Godzilla* franchise, is a gigantic moth that is interpreted as a symbol of feminine power. Notably, the narrator mentions that *Godzilla* is a symbol of nuclear war and destruction, which *Mothra* stands in opposition to and challenges nuclearization and militarization.

Drawing on Jose Estaban Muñoz's (2009) *Cruising Utopia*, the film introduces queerness as an ideal, a utopian vision for the future that is "not yet here," the narrator Mykki Blanco asserts. According to an interview with the artists (2020), queerness in the film denotes a potentiality of transformation and change. This definition of queerness, as a potentiality and *ongoingness*, aims to be reflected within the metaphor of the metamorphosis itself. In the proposal, the metaphor is accurately activated by placing the capitalist economic system based on the stages of metamorphosis. The last stage of metamorphosis (imago) fits quite well as a model for supporting a speculative future proposal, which is based on imagining an alternative to the current global capitalist system. A layered, transformative act of the organism gives a hopeful beginning for an imaginative transformation of the socioecological systems.

At this last stage of the film, the potentiality of queerness as a destination for the future is sustained with examples of the species that display different sex characteristics. As the organism transforms into a gynandromorphic eastern swallow tale butterfly, we are informed that gynandromorphic species carry female and male visual characteristics. Other examples that challenge binary models of sex and heteronormativity from more-than-human worlds, include fungi which may have more than thirty-six thousand sexes. The examples from other species prepare a ground for a vision of the future beyond binaries. Blanco signals the importance of imagination to the spectator as a vital capacity that takes part in constructing a view of a different world and adds, "Imagination is possibly the most critical tool for a queer future since you cannot start building an alternative future without first imagining it." With this quote, the film underlines the constitutive role of imagination in opening up space for actualizing or noticing a possibility that is not yet here; imagining it is the first step to make it attainable.

Proposal for a Speculative Future

Until this point of the film, the narrators keep a critical tone in their approach to economic and social inequalities, heteronormative patriarchal system, solutionist discourses put

forward by capitalists, and military-industry driven motives of some scientists and academics, while endorsing the critical tone with symbolic figures and metaphors. In the last part of the film, the critical tone is kept; however, a more speculative approach is taken. We can see the influences of Donna Haraway in the film's speculative proposal for a queer future. Kinship is emphasized as a core element to queer relationships is mentioned since kinship is pursued as part of a method of survival in the queer family against normative norms that play a role in Othering. It is also apparent that the film recognizes the popular storylines told by various social actors and aims to undertake a response-ability of finding non-traditional ways of relating to (nonhuman) Other, and for avoiding a limited understanding of evolution by pointing out to the realization of symbiotic assemblages.

“This project began with imagination, dreaming, and a refusal to feel helpless, and yes, we hope that ‘Metamorphosis’ inspires more of that refusal, more imagination, more dreaming, if nothing else.” (IQECO, 2020)

By delving into the relationships within queer families and queer insights on kinship and kin-making, the film prepares the ground for simulating imagining a future beyond rigid structures ingrained in binary categories. *IQECO* acknowledges the capitalist appropriation of queer identity. Blanco asserts, “queerness simultaneously is less interested in being a consumer, although marketing agencies try hard to do that to capitalize on queer identities.” However, while the proposal aims to place queerness as an outside consumer market, it offers queerness quite straightforwardly as an alternative to capitalism (assuming that queerness involves an inherent economic model to it?) On the other hand, from a less speculative point of view, *IQECO* also proposes that the *Green New Deal* could be a way to start addressing climate change. With this suggestion, however, the film seems to be limiting its imaginative potential and the scope of its proposal by offering an already existing political agenda envisioned for the global North. Contradicting this point, the proposal, for the large part seems to be advocating for building models of international forms of solidarity and togetherness.

In the following, the narrator starts detailing their imagination of an alternative model to extractive petrocapiatalism. The speculative proposal for a new organization of the economic system is envisioned to be dependent on renewable energy, and according to *IQECO* this new system should be in harmony with the earth systems. In order to achieve this harmony, the proposed speculative economic model is a new form of governance that *IQECO* refers to as

helio/hydro socialism. While introducing an intriguing term, the proposal leaves the viewer with too many questions since it does not adequately address what this speculative model of economy entails, how it reorganizes production and consumption patterns when compared to petrocapi-talism. More importantly, there is no mention of the relation between this speculative economic system with queerness. Nevertheless, the didactic style of the film walks on slippery grounds with at times vague wording of the imagined elements that are vital for a well-rounded speculative future proposal. Overall, the film in its four parts offers a detailed criticism of the sociohistorical dynamics of the ecological crisis that remain less noticeable behind the doomsday narratives. It is an invite for thinking, and rather than triggering a panic mode which blocks our thinking, it strives to carve out a frame for a meaningful intervention and imagination together with its shortcomings.

Critical observations on the Speculative Potential of the Artwork

After discussing the parts of the film in detail, I intend to build further upon my analysis through some critical observations concerning the artwork's proposal for a speculative future, its approach to narration and imagination by referring back to the theoretical perspectives and approaches I have presented in the context of feminist SF practices.

I- Ironical Sense of Play in Narration

The film follows a creative and thoughtful path in its critique on the socioecological crisis and its economic, sociohistorical dimensions using the metaphor of the transformative process of metamorphosis. As an artistic project, it encourages the audience to form connections between seemingly distinct phenomena of climate change and socioeconomic inequalities openly and engagingly while highlighting the potentially critical role of imagination in constructing a proposal for its vision of an alternative, queer future. Queerness is presented as a proposal for a utopia. The film follows a similar line of utopian thinking present in literature, especially science fiction within the 60s and 70s, primarily inspired by the revolutionary environment of the era.

A central concern that I aimed to highlight within the scope of this thesis was the sociocultural aspect of imagination shaped through the theoretical framework provided by the

practices of feminist SF. In this sense, the project fits in this framework by noticing the Anthropocene's popular storylines and deconstructing the discourses of various social actors and their specific agendas while bringing forward the hidden, less recognized historical and social processes of the climate crisis and ecological degradation.

As an essential tactic of feminist SF, in the previous chapters, I have focused on how feminist SF writers such as Haraway and Le Guin incorporate imagination and fiction to go beyond reductive ways of thinking established through stories constructed by various social actors. The film takes on a similar task to critique industry-driven scientific narratives by mimicking educational science films. As *IQECO* members assert in an online talk presented by the *Guggenheim Museum* (2020), narration style as a science documentary film is a conscious artistic choice. They aimed to bring an ironical sense of play by mimicking nature documentaries to an alternative to the heteronormative science narration and storytelling.

Another point that comes forward through the ironic gameplay intended by *Metamorphosis* is the relational dynamic between speculation and sociocultural realities that affect speculation. Cinematographer Jake Sillen, a member of the collective, asserts in an interview with the collective, "One of my favorite part of the project is that the whole thing is like a satire of BBC documentaries narrated by David Attenborough. But it also is a manifesto. It works from both sides." (Guggenheim, 2020) On an interesting note, with this artistic choice, the film is interpreted as a tribute to the analysis of popular media platforms and their content creation by scholars such as Donna Haraway and Noam Chomsky in the 80's. (Jones, 2020) In this format introduced by the open media collective *Paper Tiger Television*, artists and scholars were invited the audience to think critically about the information presented in mass media. A familiar example that we might recall from earlier is Haraway's analysis of the *National Geographic* documentaries focusing on the case of the 'cultured' gorilla *Koko*. Still, it is not hard for the spectator to get caught in the didactic narration style, which coincides with the intended ironic tone. The ironic aspect of the narration becomes more apparent once we are provided with a detailed description of the artwork.

II- Metaphorical Possibility for Transformation

The film provides a framework for thinking about how an alternative to the current global economic model might take shape based on the transformative power of organisms. The metaphor of the metamorphosis builds a creative framing for the critique of the current world system while signaling for hope and the possible emergencies that might come out from times of crisis. However, if we consider the early stages of metamorphosis, the model might risk giving a lead to an assumption that in order to transform, capitalism ‘has’ to go through the steps of larva and pupa where the vital need of the organism is to consume; ultimately supporting a linear model of development.

By focusing on the deconstruction and critique of the commonplace storylines, the film engages the imagination as a critical tool for cultivating a belief in the possibility for a change, as reflected with the metaphor of metamorphosis. However, the metaphor presents a dilemma where its transformative power, when founded based on capitalist logic of expansion, presents a risk of amplifying capitalist ability to change and transform itself through adapting to certain social values and identities. Even though the film seems to acknowledge capitalism's adaptive potential, it overlooks the possibility that the metaphorical foundation of the speculative proposal may be easily altered with the same emphasis on transformative potential. In a similar vein, the alternative economic model that the film builds its speculative proposal by placing 'queerness' as a transformative tool without changing the underlying logic of capital expansion. In doing so, the proposal hopes for a redistribution of wealth and assets obtained by capitalism at the risk of maintaining its underlying mentality which appropriates nature as a resource.

III- Potentials for *Unfinishedness*

An effective proposal for an imagined speculative future should probably leave space enough to make one wonder or even open space for the audience to contribute more ideas. Roy Bendor (2018), in his analysis on interactive media and the concept of imagination, asserts “the imagination appears essentially incomplete.” (p.146) Drawing on Umberto Eco’s *The Open Work*, Bendor reflects upon the potentials of various artworks, from musical works to literary works, to leave enough space for the audience or other creators to contribute their interpretation to the piece.

While explaining the relationship between creativity and imagination, in the first chapter, I have mentioned how the experiences of a cultural artifact may activate certain memories and feelings which may be used for further creation. Bendor (2018), drawing on Umberto Eco's ideas on artwork's potential for creating meanings, emphasizes a similar point. Still, in this case, *unfinishedness* becomes an element to consider in the processes of creative, artistic creation, and art criticism. Furthermore, the term *unfinishedness* can be thought of in relation to Haraway's *ongoingness* in feminist SF practices; *ongoingness* presents an invite for continuity in imagination and thinking²⁴.

In *The Open Work*, Umberto Eco (1989) considers the literary works, and works of art as an open, dynamic process. In a speculative future proposal the element of openness becomes more integral since speculation's "most central feature is openness." (Guggenheim, Kräftner, et al. 2017, p.150) According to Eco, literary texts seek for the reader's input to do some of their work. The literary text opens up space for the audience's engagement and imagination to fill in the gaps. In doing so, the artwork or text does not finish itself as a finite work but incorporates the recipient as part of the work "by *signaling* its openness, *suggesting* ways in which it may be opened further, and *prompting* the reader/ performer to complete or 'finish' it."(Bendor, 2018, p. 147, emphasis in original)

According to Bendor (2018), *unfinishedness* denotes a range of escalating possibilities. (p.148) Artworks evoke different kinds of imaginative responses from the spectators. The escalating range of possibilities explained through the *unfinishedness* of imagination might lead us to consider the plurality of different experiences of other worlds. In the case of the first artwork, *We Live in an Ocean of Air*, considering a plurality of diverse experiences was more apparent with the creative and empathic approach for relating to other forms of beings and worlds. (e.g., we were brought to imagine the forest from the ground as a spider) While the speculative approach of *Metamorphosis* also allows us to notice different worlds, the film presents its approach to the future as an ideal; it is put forward as an ideality for a queer utopia. While this call reflects a strong desire to overcome the oppressive modes of heteronormative patriarchy, we should be concerned with whether this sorted-out approach to a queer utopia would allow for a space for self-critique and plurality.

²⁴ Regarding storytelling practices in feminist SF, *ongoingness* derives from different modes of experiences and their plurality, allowing for telling 'big-enough' stories.

I have already pointed out the tension that stems from the didactic narration style and speculative formation of the film. The term *unfinishedness* helps elaborate on the speculative aspect of the art project, which intends to address the spectator's imagination for a transformative proposal on existing socio-cultural, economic realities. As mentioned earlier, *Metamorphosis* presents the spectator with policies such as *The Green New Deal*, next to suggestions for undertaking economic models such as helio/hydrosocialism that appear both over-determined and vague at the same time. The choice of the presentation without the speculative elements within the proposal could work better in a different context. However, more 'serious' or over-determined aspects in the proposal together with speculation lead to confusion. "Speculation by definition is not about telling a story with a predefined narrative arc." (Guggenheim, Kräftner, et al. 2017, p.150) The pre-determined elements that are weaved in film's speculative proposal hinder its potential for further imagination, limit its ability for *unfinishedness*.

Conclusions

Reflections on the Contemporary Artworks and Playing the Games of Feminist SF

In this thesis, my involvement in theoretical approaches of feminist SF practices, and their aim to deconstruct the human-centered, ‘Man’ made narratives, took shape around the concept of imagination. In the first chapter, I have analyzed the concept of imagination and framed it in the context of feminist SF with its relational, sociocultural, and constitutive aspects. Practices of feminist SF entails science fiction and include a wide range of creative practices, including storytelling, arts, and design, most accurately explained with the metaphor of string figures by Donna Haraway. By including the analysis of case studies, my goal was to expand my theoretical framework through a practical engagement with contemporary artworks, and to offer a series of critical observations. The main research question of this thesis that has led my research on the practices of feminist SF was: how might the chosen artworks, *We Live in an Ocean of Air*, and *Metamorphosis* illustrate the ideas presented within the realm of feminist SF practices? In order to address this main question, more specifically, I have posed: how do these artistic projects provide an outlook on human-nonhuman, human-earth relationships; what could be some of the shortcomings in their approaches?

In the first two chapters of this thesis, I have presented my theoretical framework. Haraway’s use of the cyborg concept has been central to the way the thesis has approached to the ideas of feminist SF. By incorporating the figure of the cyborg, I was able to explain how feminist SF practices can support the thesis’s theoretical approach to the capacity of imagination. Haraway’s use of the cyborg concept in the context of feminist theory has intended for creating a complex figure that encourages one to think. Thinking together with Haraway’s cyborg figuration as a node within the SF games, I have demonstrated how feminist SF practices engage in cultural critique by questioning the origins of popular narratives and storylines by realizing the storytelling techniques of various social actors. Through the concept of the cyborg, I have discussed the aim of feminist SF in challenging established forms of thinking such as human exceptionalism that shape linear understandings of cultural development influenced by the motives of patriarchal capitalism. The cyborg has been a central figure in this thesis to explain the ways in which feminist SF practices engage in cultural critique and expand on their

critique through the creative tactics and practices that simulate imagination as a sociocultural capacity.

Bridging the “theoretical trope” (Haraway 2016, p.31) of feminist SF to contemporary artistic practices, I have elaborated upon how these creative approaches could support fall short with respect to the critical perspectives of feminist SF. Even though artistic practices can be considered as allies for imagination, experimentation, and for thinking critically, one crucial outcome out of the analysis has been the importance of remembering that artistic practices too function in a particular system and follow traditions or structures carved out by the existing political and social dynamics.

Presented as a feminist figuration, Haraway’s approach to the concept of the cyborg can lead to the realization that creative artistic and creative practices, science, and imagination are always situated within a sociocultural context. It was a dangerous challenge that Haraway undertook with the concept of the cyborg since its military-industrial connections presented a quite inimical stance to feminist struggles against the narcissism of historically favored positioning of ‘Man’. However, the figure precisely was directed as a criticism to the patriarchal arrangement of cultural values. Despite its controversial background, the cyborg has consistently presented with its ironic, hybrid formation that nothing takes place in isolation.

Suggesting that feminist SF practices support a non-linear, relational outlook on the capacity of imagination, my goal was to take a closer look at how writers of feminist SF would conceptualize the capacity of imagination and to offer an analysis on the question of how their conceptualization could be activated through the engagement of contemporary artworks. Following this line of questioning, I have provided a sociocultural analysis of the concept of imagination. Through building on perspectives from sociology, and sociocultural psychology, it was possible for me to demonstrate how imagination can travel between individual and collective levels of meaning-making through the elaboration on how the experience of cultural artifacts such as a story or an artwork could stimulate a flow between “individual’s imagination and more collective social imaginaries.” (Bendor, 2018, p.132) On a social level of inquiry on imagination, by looking at the concept of imaginaries, used by scholars such as Charles Taylor and Shelia Jasanoff (paying attention to their specific conceptualizations of the term), I have considered how the study of the cultural artifacts and processes can guide us into understandings and certain beliefs around various social phenomena. Following my research

question, how do the practices of feminist SF conceptualize imagination?, in the second chapter, I have detailed my inquiry on mixed practices of feminist SF by building upon Ursula Le Guin's carrier bag theory of fiction. The short essay by Le Guin presents an intervention on how common storylines guided by historically dominant, patriarchal modes of tale-making that shape and confine the collective historical imagination.

Imagining for an 'alternative' is a response-able undertaking since it requires recognizing addressing social and political realities. If we are to recall Le Guin's ideas on SF, she has pointed out to the critical work of fiction by positing the work of fiction as a way of describing "what is, in fact, going on." (Le Guin, 1986, p.8) For Le Guin, imagination and fiction are ways to approach the present order to question the possibilities for other worlds. Imagining requires questioning the well-recognized storylines, even those seemingly unquestionable or orthodox, be it of religious origins, technological or scientific discourses.

Practical Involvement with the Ideas of Feminist SF

Through engaging two artworks that combine artistic practices with scientific knowledge, and building upon ideas I have presented through feminist SF practices, I aimed at showing how the storytelling techniques of science, once recognized by art practices, could be presented in an engaging and a thoughtful way, by bringing forward the critical aspects of scientific knowledge that seem to be under covered. Once again, Haraway's use of the cyborg concept as an outcome of feminist imagination has been critical for preparing the ground to understand the importance of creating big enough stories that include other forms of (sensuous) or left out knowledge influenced by lived experiences. The case studies *Metamorphosis* and *We Live in an Ocean of Air* both focus on symbiotic interrelations and co-dependencies within human and nonhuman worlds, in contrast to the incomplete or altered historical readings of scientific developments. In this regard, I have discussed several examples during the analysis of the case studies.

The inquiry into relational and constitutive aspects of the imagination has allowed me to detail my questions on how certain cultural experiences, generated by arts and sciences, may guide the individual's imagination to relate to another being, to understand or empathize with the (nonhuman) Other, a motive ingrained within the works of the writers of feminist fiction

and SF to challenge racial, gendered, or anthropocentric forms of biased worldviews. In parallel, the thesis's engagement with imagination and its role in studying natural-cultural relationships has helped build connections between the interrelated traces of thinking and practices that correspond to the games of feminist SF for telling the stories of multispecies worlds and interspecies relations- with a focus on contemporary artworks. For instance, the first case study, *We Live in an Ocean of Air*, 'translates' the insights gathered from biology and offers an immersive experience through using VR technology to tell the story of the co-dependent relationship between animals and plants with an emphasis on air.

The artwork is not presented with a feminist approach to the study of interspecies relations. However, it is possible to see the influences from critical feminist perspectives on scientific knowledge production and feminist inquiries on human-nonhuman relationships with a closer look. A critical observation has been made by art theorist Yvonne Volkart (2020) on a related note. Volkart (2020) has suggested that even though feminist scholars have made significant contributions to the study of human and nonhuman relations and inspired fields in humanities and sciences to go beyond their human-centered approaches, within most arts and museum discourse, these achievements of feminist writers and scholars remain underacknowledged. (p. 114)

More artists, cultural theorists, scientists, and creatives direct their attentions to future scenarios, world-making practices, and (non)human worlds in the face of species extinction and biodiversity loss. The ongoing challenges presented by climate change and ecological disasters have directed more attention to the notions of entanglement and interconnection; proposals for establishing multispecies care and kinship have become a domain for future imaginaries in the creative approaches to the Anthropocene. It has become more common, for example, to create narratives that argue for the interconnectedness of all beings and the intricate relationship between different species, humans, and nonhuman entities. The chosen artworks have been examples for this turn of interest across fields.

A critical observation that came up through the analysis of the artworks was that artistic approaches to human-nonhuman relationships while focusing on developing storylines or narratives that support the vitality of species entanglements might tend to flatten the nuances or the specificities of these relationships. For instance, during the analysis of the artwork *We Live in an Ocean of Air*, I have pointed out how the feeling of awe and wonder created through

the aesthetic experience of the artwork in VR (with an emphasis on air as a magnificent link that fosters the relationship between animal and plant), leaves out the consideration or questioning of possible harmful or dangerous aspects of human-nonhuman relationships.

Through the use of virtual reality, *We Live in an Ocean of Air* invites the audience to experience the forest from the eye of another being. Building upon Jakob von Uexküll's use of the concept of *umwelt*, I have tackled the question of how the artwork mobilizes the imagination of the audience in the context of the conceptual engagement of artwork on the symbiotic, co-dependent relationship between different organisms. By turning to the figure of the cyborg, I have explained that sensory technologies, such as virtual reality by helping our perceptual abilities, can play a role in facilitating forming empathic imagination with another being.

From a contrary, critical perspective, I have also proposed in the context of the artwork that the use of virtual reality technology can also create a form of distraction from the artworks' goal in creating awareness on interspecies dependency by creating a dream-like state in the aesthetic experience of the virtual reality piece. In other words, abstraction created within the VR environment might distract the audience from the realities of environmental crisis, or material realities of cyborg technologies. These critical observations concern the broader artistic practices, and cultural production, situated in the structural webs and sneaky ideologies of petrocapiatalist economy, together with the growing interest in the ecological approaches within contemporary artistic works created in the intersections of art and technology.

Ironic and metaphorical approaches to the current socio-ecological crisis could open up ways to 'stay with the trouble' and encourage thinking or imagining transformational potentialities with avoiding getting caught up in doomsday narratives that block imagination, as we have seen with Haraway's use of the cyborg concept. Through the engagement of the second artwork, *Metamorphosis*, I have analyzed the artwork's metaphorical and critical engagement with the climate crisis and its intrinsic connections with patriarchal capitalism.

The video series, with its provided outlook on imagination, has supported my theoretical framework. Providing a recognition of patriarchal modes of storytelling techniques the film incorporates the capacity of imagination to point out a possibility for transformation, focusing on its constitutive and socio-critical roles. The film is constructed as an educational science documentary. As Rachel Mayeri (2008) asserts, "scientists produce spectacular imagery and

powerful stories, which they cleverly narrate for the public.” (p.66) The film presented an ironic, creative approach in its artistic interpretation of narrative styles of mainstream science documentaries. *Metamorphosis*'s artistic style is intended at providing a sense of ironical play, a tactic that I have covered through the feminist SF practices.

A critical aspect to consider within the elaboration or the creation process of speculative proposals or speculative fiction is the potential of the cultural artifact to signal a kind of openness. In a speculative proposal, this openness may invite for imagining further, or suggest “ways in which it may be opened further.” (Bendor, 2018 p. 147) According to Bendor (2018), artworks can evoke, provoke, or stir the audience's imagination from a perspective that invites us to consider the potentials of the incompleteness of imagination. (p.46) The *unfinishedness* of imagination which I have elaborated together with *ongoingness* of feminist SF presented a challenge to the speculative future proposal presented by the film. *Metamorphosis* presents an intriguing example for the combination of imagination and cultural critique. Still, when considered together with ideas of feminist SF, I have observed that the speculative elements within the proposal, accompanied with pre-determined story arcs, presents a limitation for its potential of *unfinishedness*. These limitations are introduced through the support of already-existing political agendas, a top-down approach for a utopia, which hinders the imaginative potential of the proposal.

Limitations of the research and Potentials for future research

The thesis has contributed to building a sociocultural framework of imagination shaped around the theoretical perspectives and struggles of mixed practices of feminist SF. I have tackled with imagination as an underlying capacity for critical reflection and speculation together with the critical perspectives of feminist SF and their questionings of ontological categories, nature-culture dichotomies marked with a form of binary thinking. In doing so, I aimed at contributing to the existing research by focusing on the role of cultural experiences in carving out a more complex, rather than a reductive vision of the world, by selecting two case studies that build their artistic approach around the insights gathered from humanities, social sciences, biology, ecology. The artworks combine scientific and cultural perspectives with fiction and speculation. Another goal in the thesis was to contribute to understanding the imaginative labor of feminist SF writers. Through an engaging Haraway's use of the cyborg

concept and other SF figures such as *Chthulhu*, I aimed at demonstrating how feminist SF practices undertake the tactic of converting the dominant narratives through re-appropriation of the dominant storylines. I aimed at taking this question further through engaging the concept of imagination to derive my understanding of how feminist SF practices could play a role in imagining otherwise.

Throughout the thesis, my focus on feminist SF intended to direct attention to the interrelated modes of being and interrelated processes, big enough stories, ideas, and worldviews that are deeply connected with cultural, historical narratives. In this regard, the concept of imagination has allowed me to draw a link between the stories that create and shape particular worldviews, and for questioning the possible outcomes that might arise through the questioning of stories that might have been or can be told. Feminist SF has offered a comprehensive mode of thinking to allow building these connections precisely because it realizes such narratives and involves a critical consideration of lived experiences and multiple factors that play a part in shaping our experience of living in a messy world.

In this thesis, I have approached feminist SF practices as a mixed-up category that involves various modes of creative reflection and practice because my goal was to engage the growing interests across various fields in the imagination for creating alternative futures worldviews. In order to think together with various creative practices, and forms of cultural experience, I have chosen two artworks that differ in their artistic approach and communication with the audience. Further research might build upon the sociocultural framing of imagination with the theoretical engagement of feminist SF to focus on a specific genre or a mode of creation that would involve a different methodological engagement within a certain field such as speculative design (e.g., approaching the speculative design practice with the framework of sociocultural understanding of imagination within the context of feminist SF practices).²⁵

By critically analyzing the case studies, I have offered a series of critical observations that pointed out some of the shortcomings in their approaches. The critique of the artworks

²⁵ As I have noted in the first chapter, some design scholars such as Luiza Prado de O. Martins, have been addressing the field of speculative design to build a more intersectional feminist approach to design practice. Introducing the non-linear framework of imagination with the theoretical insights of feminist SF, could expand this framework by building methodological and conceptual connections to feminist speculative fabulation, storytelling, and worldling practices.

revolved around the elaboration of conceptual and material aspects of the artworks. An essential outcome from this analysis was the materiality of the artworks and their functioning within the cultural industry that relies on broader extractive production and consumption patterns. Often focusing on the aesthetic experiences, conceptual engagements, or the spectacular aspects of the artworks, researchers and critics tend to neglect the material impacts of artistic works.

Further research needs to address the material impact of the alliances between art and technology. Related research in this regard is the work of Alenda Y. Chang. (2019) Chang focuses on the potential of games to create affective environments, the role of gaming and play in simulating ecological forms of thinking, and the conceptual, artistic, and material aspects of games. Her research focuses specifically on the role of gaming and the game industry. However, her questioning into the “material provenance” (p.148) of games, often a neglected area of research, as she notes, is an inquiry that should be expanded to the research in the intersection of arts and technology and critique of artistic practices.

I have selected the artworks based on their interpretation of cultural and scientific narratives and storylines, and potential to guide audience’s imagination to recognize and relate to other kinds of worlds. In the analysis of the *We Live in an Ocean of Air*, I primarily relied on online recipient observations for the virtual reality experience of the artwork. Although my analysis was supported with other found material, the aesthetic distance from the VR version of the first artwork has introduced a limitation in my approach. The broad scheme of the analysis with the involvement of a film and a virtual reality experience has sustained my questioning on the mixed practices of feminist SF. However, the framework of imagination that I formed under the scope of feminist SF can be activated in the context of a particular artistic, visual, or literary style in future research.

Imagination is a dynamic concept. My inquiry on the concept has helped me engage the multiple practices in the scope of feminist SF while also allowing me to engage the critical cultural perspectives that feminist writers combine with fiction, focusing on feminist writers Donna Haraway and Ursula Le Guin. Drawing on feminist SF writers, I have outlined the relationship between imagination, fiction, and irony. With the example of contemporary artworks, I have demonstrated how an exercise of imagination may allow questioning how sociocultural and historical processes function while assisting in experimenting with possibilities and connecting intertwined modes of thinking. However, imagination also presents

a creative yet unfinished and ambiguous capacity that we should be wary of. As we have seen together with the critical theoretical perspectives of feminist SF, stories and historical narratives can be altered in the hands of a powerful few. Finally, once again, I would like to mention the quote from Haraway, as she would advise us to remember, “It matters what stories make worlds, what worlds make stories.” (Haraway, 2016, p.12) The exercise of imagination comes with an intricate response-ability to think within relations, openly.

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