LITERARY RESPONSES TO CLIMATE CHANGE:

AN ECOCRITICAL ANALYSIS OF CONTEMPORARY GERMAN CLIMATE FICTION

by

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To Véro, ma grande sœur de cœur

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ABSTRACT

Despite constant access to scientific knowledge about climate change, mathematical models, IPCC reports and predictions are limited in conveying what rising global temperatures mean for living conditions on Earth. Storytelling, on the other hand, has the potential to appeal to our affective relationship to the material world by providing readers with multiple perspectives on the dynamics between humans and their environments. This dissertation explores the intersection of literature, culture, and the physical environment to deepen our understanding of climate change. I ask how climate fiction (cli-fi) novels, a trend of literary texts that engage with the climate crisis, contribute to new understandings of climate change as a complex socio-cultural phenomenon, focussing on contemporary German literature's participation in and challenge to the global response to climate change. I analyze a corpus of eight German cli-fi novels, published between 2004 and 2022, through an ecocritical lens. In each chapter, I discuss a set of key questions about the relationship between literature and climate change and develop a different conceptual framework to show how these texts grapple with imagining the complexity of climate change. Frank Schätzing's bestselling novel *Der Schwarm/The Swarm* (2004) serves as the hub for my analysis because of its strong emphasis on science, technology, and disaster in a realistic setting. By pairing *The Swarm* with more recently published texts that move away from the scientific, such as *Milchzähne/Milk Teeth* by Helene Bukowski (2019), this dissertation shows how contemporary German-speaking authors use the literary space to respond to climate change in terms different from scientific writing. First, I consider the challenges that arise when trying to define cli-fi as a genre, and then analyze how three cli-fi novels in my corpus navigate the relationship between literature, science, and the imagination. Second, I focus on the issue of representing non-human agencies in cli-fi. Adopting theories of New Materialism as a point of departure, I analyze three texts to discuss specific examples of formal and narrative strategies to narrate the non-human in less anthropocentric terms. I then turn to the literary development of place in the context of global crisis and provide three case studies to identify how culture intervenes at local and global scales in cli-fi novels. I conclude with a close reading of *Diese ganzen belanglosen Wunder/All These Petty Miracles* by Leona Stahlmann (2022) and the novel's environmental imagination of wetlands to creatively examine how climate change is affecting our notions of the future, our relationship with the living world, and our sense of hope. Through an investigation of contemporary German cli-fi novels, this dissertation lays the groundwork for understanding a literary shift from responding to climate change as largely a scientific issue to engaging with it poetically and affectively. No less political, these other forms of engagement raise the question of whether literary texts more generally may all be considered 'climate fiction' in the sense of being written in a climate-changed world.

RESUMÉ

Malgré l'accès constant aux données scientifiques sur le changement climatique, les chiffres et les prédictions ne permettent pas de comprendre ce que l'augmentation continue des températures mondiales signifie pour les conditions de vie sur Terre. Les récits peuvent renforcer notre relation affective avec le monde matériel en offrant aux lecteurs de multiples perspectives sur les relations dynamiques entre les êtres humains et leur environnement. Cette thèse explore le croisement de la littérature, de la culture et de l'environnement physique afin de mieux comprendre le changement climatique. Cette thèse examine comment les romans de fiction climatique (cli-fi), une tendance de textes littéraires qui abordent la crise climatique, contribuent à une nouvelle compréhension du changement climatique en tant que phénomène socioculturel complexe, et comment la littérature allemande contemporaine participe à la réponse globale au changement climatique et la critique de cette réponse. J'analyse un corpus de huit romans cli-fi allemands, publiés entre 2004 et 2022, d'une perspective écocritique. Dans chaque chapitre, j'aborde une série de questions clés sur la relation entre la littérature et le changement climatique et je développe un cadre théorique différent pour montrer comment ces textes répondent au défi d'imaginer la complexité du changement climatique. Le roman à succès de Frank Schätzing, Der *Schwarm/The Swarm* (2004), est au cœur de mon analyse, car il met fortement l'accent sur la science, la technologie et les catastrophes dans un cadre réaliste. En associant *The Swarm* à des textes publiés plus récemment qui s'éloignent de l'aspect scientifique, comme *Milchzähne/Milk Teeth* d'Helene Bukowski (2019), cette thèse montre comment les auteurs germanophones contemporains utilisent l'espace littéraire pour imaginer le changement climatique en termes différents que l'écriture scientifique. Tout d'abord, je considère les défis qui se posent lorsque l'on tente de définir le genre cli-fi, puis j'analyse la façon dont trois romans cli-fi de mon corpus négocient la relation entre la littérature, la science et l'imagination. Deuxièmement, je me concentre sur la question de la représentation de l'agentivité des acteurs non-humains dans la cli-fi. Prenant les théories du Nouveau Matérialisme comme point de départ, j'analyse trois textes afin de discuter d'exemples spécifiques de stratégies formelles et narratives visant à raconter le non-humain en des termes moins anthropocentriques. Je me penche ensuite sur le développement littéraire du lieu dans le contexte de la crise mondiale et présente trois études de cas pour identifier la façon dont la culture intervient à l'échelle locale et mondiale dans les romans de cli-fi. Je termine par une lecture de *Diese ganzen belanglosen Wunder/All These Petty Miracles* de Leona Stahlmann (2022). J'analyse l'imagination environnementale des zones humides du roman et comment le roman examine de manière créative la façon dont le changement climatique affecte nos notions de l'avenir, notre relation avec le monde vivant et notre sens de l'espoir. En analysant des romans allemands contemporains de type cli-fi, cette thèse jette les bases pour mieux comprendre le changement littéraire d'une réponse au changement climatique comme une question essentiellement scientifique à un engagement poétique et affectif. Tout aussi politique, ces autres formes d'engagement soulèvent la question de savoir si les textes littéraires en général peuvent tous être considérés comme de la « fiction climatique », dans le sens d'être écrits dans un monde en réchauffement

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INTRODUCTION:
LITERARY RESPONSES TO CLIMATE CHANGE

I. Introduction & Key Terms

The role of literature in addressing the challenges of representing, comprehending, and imagining the magnitude of climate change is at the heart of this dissertation. Situated at the intersection of literature, culture, and the physical environment, my analysis examines how novels reflect on and create narratives about climate change and deepen our understanding of this complex scientific, political, socio-cultural, and most pressing issue of our time. While climate change researchers provide us with scientific knowledge (i.e., numbers and predictions) that is the basis for our general conception of climate change, it is difficult to convey what continually rising global temperatures mean for living conditions on Earth. As philosopher and literary theorist Timothy Morton argues, climate change constitutes a "hyperobject" (*Hyperobjects* 1-3) due to its vast temporal and spatial scales, which presents a challenge to our collective imagination of this crisis. How can literature respond to such a complex issue? What is literature's contribution to our collective stories about climate change? The implications of these questions are vast and reach across disciplines, but my point of entry into this discussion is in examining how contemporary novels within the German-speaking world contribute and challenge the global response to climate change. Through an ecocritical analysis of a corpus of eight selected climate fiction novels, I demonstrate how literary works play a vital role in shaping our understanding of climate change and its impact on our planet.[1] Published between 2004 and 2022, a historical period that falls

[1] Only three of these novels have been translated into English, and my translations and close readings of these texts make them accessible to a wider scholarly audience and contribute to the study of cli-fi within German studies.

within the Anthropocene,[2] the current geological epoch in which humans are the primary cause of planetary change, my corpus participates in broader contemporary and collective climate change imaginaries.

First, I will define some of the key terms that I am using throughout the dissertation like *ecocriticism*, *literary response*, *climate fiction*, *cli-fi novels*, and *German climate fiction*. Ecocritical scholarship analyzes the multiple connections between human culture and the physical world. The term "ecocriticism" was first coined by William Rueckert who applied ecological concepts to the study of literature and proposed the idea of poems as "stored energy" within ecosystems (108-9). Similarly, Joseph Meeker introduced the concept of "literary ecology" in *The Comedy of Survival* (1974) where he proposed an interpretation of comedy and tragedy from an ecological perspective. Tracing ecocritical scholarship back to its early stages, Lawrence Buell highlights Leo Marx's *The Machine and the Garden: Technology and the Pastoral Ideal in*

[2] Paul Crutzen's and Eugene Stoermer's term "Anthropocene" has gained popularity to articulate and reflect on the consequences of living in a geological era of large-scale human impact on the environment. Historian Dipesh Chakrabarty emphasizes that human and natural histories can no longer be studied separately as a result of anthropogenic climate change, which challenges humanist conceptions of history: "The discussion about the crisis of climate change can thus produce affect and knowledge about collective human past and futures that work at the limits of historical understanding" ("The Climate of History," 221). The climate crisis demands new modes of thinking and imagining that bring human culture together with non-human processes. In the second chapter of my dissertation, I analyze some novels that foreground non-human characters as a way of decentering human perspectives in their depictions of environments. At the same time, the term "Anthropocene" has been highly critiqued. In addition to the focus on human agency as the dominant factor within the Anthropocene, critics point out that differences in class, race, and gender, as well as non-Western Indigenous perspectives, are overlooked: "'Anthropogenic climate change,' 'the Anthropocene,' then, are not precise enough terms for many Indigenous peoples, because they sound like all humans are implicated in and affected by colonialism, capitalism and industrialization in the same ways" (Whyte 159). Deeply rooted in Western thinking, the Anthropocene is a limited concept that requires constant recontextualization. For example, Jeremy Davies argues that the Anthropocene can be used as a tool to understand the massive environmental changes currently happening within the context of pre-historical and geological events. For Timothy Clark, the Anthropocene is a "pseudo-geological concept" (21). From this perspective, the Anthropocene serves as a way of marking a specific moment in human self-understanding rather than a geological concept. Clark suggests that the strength of the term lies in its ambiguity and the critical discussion it sparks. From a political point of view, articulating the environmental violence and social injustice that underpin this geological shift can also bring about an awareness of non-human agency and foster "a sense of responsibility toward non-human creatures increasingly driven to extinction" (Clark, *Ecocriticism on the Edge* 29). Thus, the Anthropocene serves as a way of situating humans within global, planetary, and geological timescales while its colonial roots point to its limitations. The way this term has been used by literary scholars or within literary texts illustrates the close relationship between science and literature.

American Culture (1964) and Raymond William's *The Country and The City* (1973) as important works (13-14). Marx and Williams look at conceptions of nature as part of cultural history and identify "the dynamics of the history of what we would now call national imaginaries in terms of a symbiotic opposition between contrasting prototypical landscapes" (Buell 14). They carve out how culture and history shape the imagination of specific environments. These early examples illustrate that studies on representations of nature in literary texts existed before the emergence of the term ecocriticism. However, ecocriticism paired literary analysis with environmental concerns and added a sense of urgency and advocacy for the environment.

I understand ecocriticism as a variety of text-based and earth-centered approaches that use tools of literary analysis and cultural studies to scrutinize how cultural practices and patterns of thought influence our understanding of the environment, but also how different environments have shaped these practices and patterns of thought. Moreover, ecocritical perspectives bring literary analysis into dialogue with environmental philosophy, science, and other fields outside the humanities. The ecocritical framework of my dissertation is situated at this interdisciplinary intersection as I address how literary writing responds to environmental crisis. I focus on the specific contribution of literary texts and ecocritical analysis to global and local discourses on climate change and environmental awareness. Here, I draw from Richard Kerridge, who emphasizes the role of ecocriticism as a critical practice that allows literary scholars to read and evaluate texts with regard to their potential to meaningfully respond to the environmental crisis (1).

By literary response, I am referring to fictional texts that are highly receptive to and emerge within the discourses that are taking place as they are being written. Haraway's notion of *response-ability* as "collective knowing and doing, and ecology of practices" (34) that highlights the ways

in which the ability to respond takes place within an intersectional space, is central to how I understand and use this concept. My dissertation examines the different kinds of 'abilities' within literature but also its constraints to respond to climate change. Although for Haraway, responses are always embodied and not necessarily verbalized or textual, the focus of this dissertation is textual responses. Drawing from Haraway's acknowledgement of the limitations that shape response-ability, I critically examine literature's constraints as a text works with language, images, genres, and literary devices. This also allows me to problematize the idea that there is only one way of responding to climate change as literature can develop different kinds of response-abilities. An "ecology of practices" works to identify the different layers that underpin the environmental crisis not only as a scientific problem but also as culturally constructed and mediated. Moreover, this practice requires imagining and thinking about climate change not only in aesthetic terms, such as form and genre, but also in ethical and political terms. Camilo Gomides, for example, emphasizes this political component by defining ecocriticism as "the field of inquiry that analyzes and promotes works of art which raise moral questions about human interactions with nature, while also motivating audiences to live within a limit that will be binding over generations" (16). Literary works, certainly including climate fiction, contribute to environmental politics in valuable ways, because they offer different perspectives on climate change. Consequently, my dissertation examines how a text incorporates environmental politics and to what end.

I understand climate fiction texts, then as kinds of response-abilities that are specific to climate change: they contribute to its complex discourse and illustrate various ways of living (and dying) in climate-changed worlds. Although defining climate fiction as a distinct genre is challenging due to the dynamic nature of this phenomenon, the term *cli-fi* describes a category of fiction that deals with anthropogenic climate change in terms of plot, setting, or character; or a

combination of these elements. It serves as an umbrella term to group texts that attempt to "imagine the causes, effects, and feeling of global warming" (Irr 1) and offer nuanced conceptions of this crisis that complicate the stories we tell about climate change. How these texts engage with and imagine different scenarios of climate change varies from issue-driven texts, which emphasize content to educate readers, to experiments with form, that render abstract notions of climate change more concrete.

The term 'climate change' is in itself difficult to define. It not only refers to scientifically measurable long-term shifts in temperatures and weather patterns but also functions as a concept within cultural discourse. Historically, 'climate change' is a relatively recent term that succeeded other ways of referring to the global environmental crisis, such as 'greenhouse effect' or 'global warming.' In *Weathered: Cultures of Climate* (2016), Mike Hulme distinguishes between weather and climate and proposes to think of climate as always mediated and part of a cultural geography. Whereas weather can be measured and immediately experienced, climate serves as a way of bridging the gap between this experience and less visible changing global atmospheric patterns. According to Hulme, climate is the cultural and abstract expression of how we make sense of the weather as a sensory experience. More specifically, climate "offers an ordered container, a linguistic, numerical or sensory repertoire, through which the unsettling arbitrariness of the restless weather is interpreted and tamed" (4). This way of thinking about climate is a new phenomenon because climate change occurs on vast global scales that go beyond how weather is experienced locally. This radically shifts the notion of climate from abstract and stable to something that is transformed by destructive human behaviours and alters planetary living conditions in unprecedented ways. Hulme then explains that cli-fi grapples with the representation of climate change in its dual role as a scientific and cultural event:

> Representing climate in fiction is never an exercise in the mere translation of scientific concepts into literary form. It is rather about recognizing the physical, sociological, political, and psychological complexities of climate and capturing these complexities in a story. (7)

By visualizing these complex aspects of climate change through storytelling and imagination, cli-fi contributes and adds value to political and scientific discourses on climate change and their communication to the public. In its attempt to narrate and imagine climate change, cli-fi establishes and examines the relationship between climate and weather.

Literary writing that reflects human thinking about meteorological phenomena and shapes how we conceptualize climate has a long tradition. This kind of environmental writing incorporates shifting notions of the relationship between humans and climate as part of their environment. These range from ideas about weather as part of an enchanted and mystical natural world to scientific perspectives on quantifiable weather patterns in the Enlightenment. As Jim Clarke notes, cli-fi did not evolve in a vacuum. Clarke labels texts published in the 1950s and 1960s that addressed public concerns about the climate, such as the work of J.G. Ballard, as "proto climate-change fiction" (8). Similarly, Adam Trexler identifies a "considerable archive of climate change fiction" (*Anthropocene Fictions* 8) that preceded contemporary cli-fi novels, such as science-fiction novels that imagine nuclear winters (e.g., *Do Androids Dream of Electric Sheep* by Philip K. Dick, published in 1968). Whereas these older texts focus on weather cycles as they were experienced before the rise of climatology, such as seasonal patterns, more recent cli-fi emphasizes the ruptures of these cycles and offers nuanced perspectives on the ripple effects of global climate change.

The discourse about climate has morphed over time, and so has literary engagement with this topic. As public awareness of shifting weather patterns and anthropogenic climate change rose by the end of the 20th century, a growing number of literary texts imagined environments and our relationship to them in the context of global warming. Trexler and Adeline Johns-Putra suggest

that the history of cli-fi began with the rise of public consciousness about environmental issues in the 1970s (186). Johns-Putra and Kelly Sultzbach point out that science fiction texts in the 1980s imagined climates regulated by technology in response to climate mitigation efforts (5-6). Similarly, Trexler highlights the increase in the publication of novels dealing with the theoretical malleability of global climate in the 1990s and onward (*Anthropocene Fictions* 9). This trend of fictional texts that imagine different climate scenarios coincided with a spike in climate-change activism in the 1990s and early 2000s (e.g., the publication of the first *Assessment Report* of the *Intergovernmental Panel on Climate Change* in 1990). Trexler further identifies a focus on anthropogenic climate change and "the historical tension between the existence of catastrophic warming and failed obligation to act" (*Anthropocene Fictions* 9) as defining features of contemporary cli-fi.

By the early 2000s, cli-fi became recognized as a legitimate literary genre in the Anglophone world (Goodbody & Johns-Putra 230). In the German-speaking world, "Klimawandelfiktionen" and "Klimawandelromane" (Mayer 367-8) were considered as literary genre as well (i.e., Mehnert 2012), and as Adeline Johns-Putra points out: "There has emerged, too, a range of climate change novels outside the Anglophone world. The majority of these are German" ("Climate change in Literature" 269). However, this genre's features and narrative characteristics keep developing in ways that make cli-fi difficult to define. One of the main points I make throughout my analysis is that cli-fi does not comply with a set of fixed genre characteristics but continuously evolves, formulating diverse literary responses.

While climate change is often understood as a global environmental issue, literary writing is bound to a certain locality and national context by the very fact that texts are written in a specific language. I explore this tension between the global scale of planetary change and the local context

of literature by analyzing German cli-fi from a dual perspective. Using 'German' as an adjective, rather than being written 'in German,' places the analytical focus on the specific cultural lens through which a text imagines climate change. This focus allows me to contribute to the study of cross-cultural responses to the climate crisis in literary texts. Because climate change occurs on a global scale, however, I carefully bring this cultural-specific perspective into dialogue with global perspectives. Some of the novels in my corpus are intentionally situated in a non-German or global context. Here, I am using 'German' as language rather than culture. Of course, this does not mean that I view language and culture as separate. Rather, this dual approach allows me to critically reflect on when it is beneficial to refer to *German* cli-fi to highlight *concrete cultural elements* and when it is restrictive in terms of analyzing how novels *written in German respond to a global dilemma*. On the one hand, my analysis of German cli-fi novels contributes to the study of cultural elements (i.e., the question of a local sense of place in Chapter Three). On the other hand, it responds to the need for global perspectives on climate change in literature, including different countries, continents, and languages.

Examining my collection of German cli-fi novels from this perspective, I demonstrate how each text responds to climate change in its unique way. This distinction is crucial in understanding the tension that climate change creates within national literatures. My dissertation does not seek to define German cli-fi. Instead, I am interested in the relationship between local elements and global perspectives in my corpus since addressing climate change does not allow texts to stay within cultural boundaries.[3] I ask how a subset of authors from the German-speaking world deal with the challenges and global underpinnings of the issues they address in their fictional works.

[3] This non-national tendency is widespread in cli-fi. It is illustrated by the genre's recurring interest in narrating the complex spatio-temporal scales of the climate crisis and its impact on different ecosystems, including non-human worlds.

Ecocriticism and Climate Change: An Overview of Recurring Questions

Because ecocriticism is a vast interdisciplinary field that deals with various methods and approaches, I will focus on the issue of climate change in literature. In this section, I will map out key moments in ecocriticism and address questions that ecocritical scholarship revisits frequently. These questions include the relationship between text and the world in conceptions of nature in literature, the place of environmental politics within literary studies, the implications of combining science and literature, and the tension between cultural and global perspectives. Through a discussion of these recurring questions, I will demonstrate how thinking about climate change developed within the field over time and where my approach to contemporary German cli-fi is situated.

Despite a strong interest in protecting the environment and a focus on the relationship between humans and their environment, ecocritics did not pay as much attention to the issue of climate change and the implications of the climate crisis for literary writing when the field started to emerge. Many other aspects of the environmental crisis were acknowledged as illustrated, for example, by Glen Love's emphasis on the need to revalue nature-centered literary texts in terms of their "eco-consciousness" as opposed to "ego-consciousness" in his contribution to *The Ecocriticism Reader* (1996). A general concern about many different environmental issues and their impact on questions of literature and culture (Kerridge & Sammells, 1998) has always been a key element of the field. I would argue that the emphasis on climate change as a global issue that challenges local perspectives in literary texts and the need for cross-cultural perspectives developed over time and is now a distinctive feature of contemporary ecocriticism.[4]

[4] For example, the critique of land-based perspectives recently voiced by ecocritics like Dana Phillips, who examines new materialism and trans-corporeality as they extend to marine environments, is significant because of the key role of the ocean within the global imagination of climate change.

Buell's wave-model to describe how ecocriticism evolved historically and Scott Slovic's subsequent extension of it are helpful to contextualize where the question of climate change fits within the different strands of ecocriticism. Although Buell points out that ecocriticism cannot be summarized as a homogenous theory, he identifies two important waves in the evolution of environmental criticism. He clarifies that these waves build upon each other and form a palimpsest of ecocritical trends (17). During the first wave in the 1980s, ecocritical scholarship was primarily concerned with the study of British and American nature writing and nature poetry, such as William Wordsworth, Henry David Thoreau, Walt Whitman, and Emily Dickinson. This initial focus on specific linguistic, cultural, historical, and literary contexts, also included a sense of protecting the environment from the harmful effects of human activity and an emphasis on the potential of literature to give voice to nature.[5] While ideas of preserving a 'wild' environment, untouched by humans, maintained the distinction between nature and culture, ecocritical scholars began to reflect on the intertwinement and constructedness of nature/culture and human/non-human dichotomies. Buell explains that second-wave ecocriticism conceived of the separation of nature and culture as "a historically produced artifact," and that "throughout human history nature itself has been subject to human reshaping" (93). Therefore, ecocritical work not only entailed analysis of 'natural' or 'wild' environments, but also considered 'built' environments to explore the breaking down of the above-mentioned boundaries in urban, industrial, and other environments. In addition to an expanded notion of environments, the field became increasingly interdisciplinary and heavily focused on issues of environmental justice:

[5] First-wave ecocriticism and its focus on nature writing in an Anglophone context impacted German ecocritical scholarship and later led to discussions of German literature through this lens; for example, *Mutter Natur und die Dampfmaschine* (1991) by Gerhard Kaiser, *Topographies of the Sacred* (2004) by Kate Rigby, and *Natur – Kultur – Text. Beiträge zur Ökologie und Naturwissenschaft* (2005) edited by Catrin Gersdorf und Sylvia Meyer.

> The prioritization of issues of environmental justice - the maldistribution of environmental benefits and hazards between white and nonwhite, rich and poor - is second-wave ecocriticism's most distinctive activist edge, just as preservationist ecocentrism was for the first wave. (Buell 96)

During this second wave, postcolonial perspectives contribute to ecocriticism's concerns with justice and transformation.[6]

The focus on North American or British authors shifted to an interest in the cultural diversity and plurality of environmental imaginations. Patrick Murphy points out that including works of literature from a variety of countries is necessary to "enable critics to place that literature in an internationally relative and comparative framework" (58). This interest in transcultural perspectives led third wave ecocritics to consider the relationships between national literatures and comparative frameworks, especially in the context of climate change as a global crisis that shapes local environmental imaginations (Slovic 2010). I will come back to this point when I address cross-cultural perspectives and unpack the significance of Ursula Heise's concept of "eco-cosmopolitanism" for ecocritical thinking about climate change.

According to Slovic, global concepts of place, comparative approaches concerning national and ethnic conceptions of the environment, and a trend towards materialism in ecofeminist theory are particular to third-wave ecocriticism (7). In my dissertation, I address questions of materiality, systemic transformation, and cross-cultural responses in the context of a specific literary trend (climate fiction) and cultural context (German environmental imaginations). I provide a critical cultural analysis of the literary engagement with climate change and identify the specific contribution of contemporary German literary works outside the North American canon. I show

[6] In an article entitled "Greening Postcolonialism," Graham Huggan argues that postcolonial criticism can add value to ecocriticism by correcting the blindness to cultural perspectives of certain strands of ecocriticism. In return, ecocritical perspectives can challenge anthropocentric tendencies within postcolonialism.

how the cli-fi novels in my corpus challenge a sense of place, imagine dynamic relationships to the non-human world, and experiment with the multiple techniques and strategies of literature as they engage with climate change. Furthermore, I ask how these texts contribute to political discourses about this issue and to what extent they create their own climate change imagination. The theoretical approach of my dissertation combines literary analysis with ecocritical perspectives on issues of representation and genre conventions, the relationship between literature and other disciplines, and the tension between local and global conceptions of environments.

The study of literature from an ecocritical perspective requires a careful consideration of the ways in which texts imagine physical environments (Glotfelty xviii), but also how this imagination is shaped and affected by the material reality of the environments depicted in a text (Grewe-Volpp 71-74). As the British philosopher Kate Soper points out in *What Is Nature?: Culture, Politics and the Non-Human*, the term 'nature' consists of multiple perspectives that demand constant redefinition (2). On the one hand, Soper speaks of "nature endorsing" (4) perspectives, which define nature in ecological terms as a material reality that is being exploited and destroyed, emphasizing the need to value this material reality. On the other hand, a "nature skeptical" (4) point of view argues that nature is always already constructed (e.g., semiotically), emphasizing the ideological functions and cultural constructions that underpin the term nature. Within ecocriticism, there is often tension between nature-endorsers and nature-sceptics. But I believe that both perspectives are necessary to gain a deeper understanding of climate change narratives from an ecocritical perspective since this crisis affects the material reality of the planet in a very concrete way while at the same time marking a politicized and culturally mediated phenomenon.

Literary scholar Ursula Heise explains that skepticism with regard to the concept of nature, which existed notably in the intellectual landscape between the late 1960s and early 1990s, caused a late arrival of environmentalism within literary studies despite the emergence of green movements in the political sphere ("Hitchhiker's Guide" 505). The tension between ecological materialist and social constructivist perspectives has significantly shaped the development of ecocriticism. Third-wave ecocriticism is particularly influenced by theories of posthumanism and material feminism. Donna Haraway's notion of nature-culture plays an important role in this context (*Companion Species Manifesto* 2003). Christa Grewe-Volpp explains the significance of these approaches as they strive for "a balance which recognizes historical, social and cultural achievements, but which at the same time foregrounds the autonomy of an extra-human reality as well as its capacity to act" (76). As a representational, cultural, scientific, and political issue, climate change sits between these dynamic co-constructive interactions between human and non-human.

The call to shift from anthropocentric positions to ecocentric worldviews and move away from the destructive role of humans is crucial to ecocriticism's activist side. As Cohen et al. assert: "By definition, ecological literary criticism must be engaged. It wants to know, but also wants to do" (1092). Rather than adhering to one specific political stance, ecocritical scholarship approaches environmental issues from diverse theoretical and practical perspectives. From the deconstruction of the ideological function of 'nature' to the commitment to environmental attitudes, theories of environmental politics are put into practice in various ways. Greg Garrard emphasizes the significance of other disciplines, such as Feminism, Marxism, Postcolonialism and Queer Studies, with regard to the development of ecocriticism as a "political mode of analysis" (3). Ecofeminist scholarship that links environmental destruction to forms of patriarchal

oppression is one example of such an intersectional, political mode of analysis. The focus of the ecocritical research in my dissertation lies at this interdisciplinary and "issue-driven" (Buell 11) perspective: How does literature, in dialogue with science and politics, represent, imagine, and narrate environments in an era of anthropogenic climate change?

Asking "what can literature do now" (12), Kerridge articulates the role of literature in the context of environmental crisis in terms of form and genre, distinguishing between depth and urgency.[7] According to Kerridge, the global climate crisis gives rise to complex cultural questions, but also requires urgent answers and behavioural changes. Literary criticism and writing that participates in this discourse navigates the tension between knowledge about climate change on the one hand, and (re)inventing new or old literary genres and forms to represent this knowledge. Such writing offers spaces for reflection different from political or scientific perspectives, spaces that can potentially transform culture and behaviour in response to the urgency of the environmental crisis. Kerridge posits that climactic moments, such as Pauline conversions, in different genres are one of the ways in which literature can instill a sense of care and affective response in the reader. However, he warns about the limitations of narrating the crisis in such a concentrated climactic form and calls for an expanded view that brings environmentalism into all forms of literature to shed light on "the more complex, unresolved, explanatory and human tones" (5) of the crisis. An ecocritical analysis of cli-fi thus needs to focus specifically on the formal strategies authors use to deal with the issues that arise when literature tries to narrate climate change, a complex phenomenon that resists anthropocentric storytelling.

[7] I have chosen not to approach the question of what cli-fi 'can do' from a more pragmatic perspective, such as reader-response theory, in my dissertation. This is because it is challenging to track the reception of very contemporary texts, some of which have not yet been translated for English-speaking audiences or received little critical scholarship.

The contributions of ecocritic Axel Goodbody to a "ökologisch orientierte Literaturkritik" (*Literatur und Ökologie* 28) – an ecologically minded literary criticism – within the field of German studies are particularly relevant in this context because he articulates the problem of climate change in terms of form and genre. He highlights four main challenges of literary writing that seeks to address issues related to climate change. These include effectively conveying the science of climate change, engaging in a meaningful way with its spatial and temporal scale, acknowledging the role of both natural and human agency, and addressing the complexity and unresolvable aspects of the issue on a narrative level (Goodbody, *Beyond Communication* 320–29). Throughout the dissertation, I address these challenges, drawing on the cli-fi novels in my corpus to demonstrate the diverse formal strategies that these authors develop and experiment with. While I use Goodbody's categories of narrative challenges as one way to organize my corpus, my approach differs because I compare and contrast multiple cli-fi novels and pair my close readings with additional critical concepts.

In contrast to science fiction, a genre that imagines speculative futures and engages with a broad range of scientific and technological worldviews that sometimes move beyond environmental concerns, cli-fi focuses on the question of science with regard to climate change. Although cli-fi builds on and shares some elements with sci-fi, such as a rich engagement with planetary perspectives, global issues, and speculative futures, it morphs into its own literary genre because of its specific concern for narrating *climate change* as a problem of the now and its scientific, socio-political and cultural underpinnings. As Caren Irr insightfully notes:

> If science fiction proper has often been concerned with either extrapolating technological development from existing social conditions or providing alternate histories that reimagine the supposed inevitability of the present, then cli-fi has deviated from those norms. The near-future, post-apocalyptic scenarios so prevalent in the genre often assume that the turning point for change occurred before our own historical moment… (7)

As my dissertation will show, some cli-fi texts integrate science in their world-building in ways that echo sci-fi. Yet, these texts respond to the challenges of science differently in their specific concern for already climate-changed worlds, which creates its own narrative challenges and interesting tensions.

One particular formal problem that cli-fi faces in this regard is in conveying scientific research in the field of climatology to its readers. Climatology provides scientific facts and predictions about changes in the Earth system, which find their way to the public through mediated discourses. For example, the "hockey stick graph," showing rapidly rising temperatures, became an important image for the discussion of global warming in the public after Al Gore prominently referred to it in Davis Guggenheim's documentary *An Inconvenient Truth* (2006). Similarly, cli-fi uses narrative strategies to make sense of and communicate scientific knowledge about the climate crisis. It provides models of thinking about environmental issues that oscillate between the real world of scientific facts and the fictional world of stories. For German studies scholar Barbara Naumann, the value of literature in contrast to science lies in its ability to refer back to and reflect on its medium:

> Literature is capable of incorporating a level of self-reflection into the representation of scientific processes without itself being involved in a particular science without claiming to contradict science on its terrain of immanent processes, tasks, and terminologies. The process of modern scientific research - which is not concerned with questions of curiosity, but with the verification or refutation of results and the development of new questions, methods, formulations, and terminologies […] . In this sense, literature carries out research on modern science in a specific medium: its own artistically skillful form of representation. (Naumann 512)

Although one could argue that curiosity does play a role in modern scientific research, Naumann's point about literature as a space of self-reflection is significant to my analysis of the multifaceted formal characteristics of the novels in my corpus.

III. Methodology & Dissertation Layout

Through ecocritical analysis, my dissertation examines the ways in which a subset of contemporary German fiction participates in and nuances the portrayal of climate change as a complex socio-cultural issue that requires new ways of thinking about the local and global anchoring of literature. Climate change is a global environmental problem that needs to be addressed transnationally. However, notions of a return to the local to fight environmental harm caused by globalization have shaped cultural conceptions of environmental lifestyles. In *Sense of Place and Sense of Planet* (2008), ecocritic Heise explains how local and national modes of belonging have shaped environmental imaginations and emphasizes that environmental issues require perspectives that are not attached to traditional notions of place. Heise calls for an eco-cosmopolitan approach that places environmental imaginations in the context of the global. At the same time, the multiplicity of cultural perspectives and sociocultural framings of environmentalist thinking and writing contributes to "environmental world citizenship" (*Sense of Place* 13). Although Heise does not reflect on the specific issue of climate change until the conclusion of her book, she highlights climate change as a particularly challenging global risk scenario in the cultural imagination:

> Like other processes of global systemic transformation, ecological or not, climate change poses a challenge for narrative and lyrical forms that have conventionally focused above all on individuals, families, or nations, since it requires the articulation of connections between events at vastly different scales. (*Sense of Place* 205)

Through close reading and literary analysis, I consider the 'narrative and lyrical forms' that might bridge connections between the local and the global. The focus of my corpus on contemporary

German cli-fi allows me to put the specific cultural perspective of German literature in dialogue with global, transnational, and interdisciplinary perspectives.

Although many German ecocritical scholars (such as Hannes Bergthaller, Catrin Gersdorf, Axel Goodbody, Christa Grewe-Volpp, Ursula Heise, or Heather Sullivan) work in North American contexts and seek to bridge different national literary traditions, it is possible to identify specifically German ecocritical approaches and perspectives. Instead of focussing on a genre like nature writing, these approaches examine other branches of environmental thinking in non-fiction writing and philosophy, particularly the complex engagement with conceptions of nature within the work of Johann Wolfgang von Goethe (Goodbody, "German Ecocriticism" 547). In their introduction to the anthology *German Ecocriticism in the Anthropocene* (2017), Caroline Schaumann and Heather I. Sullivan summarize the particularities of environmental thinking in German culture as follows:

> Even though environmental thinking, philosophy, and grassroots activism boast of an important and long-standing tradition in German culture from Alexander Humboldt to Martin Heidegger as well as the Green Party, literary ecocriticism arrived in Germany after burgeoning first in American and British studies. Early explorations in ecocriticism thus did not resonate as much in German studies as the more recent expansions. (10)

Similarly, Goodbody points out some specificities of German ecocriticism: the absence of a tradition of nature writing, the significance of critiques of modernity in German philosophy, and the rise of green politics in Germany after the Second World War. In addition, he explains that ideological conceptions of nature during National Socialism led to a "reluctance of German academics to engage with a subject tainted by association with racist nationalism, eugenics and the holocaust" (*Nature, Technology and Cultural Change in Twentieth-Century German Literature*, 21). This resulted in a continuing reassessment of environmental thinking in the

German intellectual tradition. There has, however, been a significant increase in publications on the German environmental imagination since the 2000s (e.g., new ecocritical perspectives on German Romanticism by Dalia Nassar, 2022).

My dissertation takes up a different side of German ecocriticism. I do not look at racist nationalism, critiques of modernity, nor specific historical periods within the German environmental imagination and literary tradition because, although I discuss examples of contemporary cli-fi novels that circulate in the German-speaking world, these texts require an eco-cosmopolitan lens that places them within broader global contexts. By focusing specifically on cli-fi, my dissertation makes a key contribution to the study of the different kinds of literary responses articulated by German-speaking authors in novels that move between the local and the global.

In each chapter, I develop a different conceptual framework to analyze the ways in which the novels in my corpus narrate climate change and to discuss potential issues that emerge from these distinct approaches. Frank Schätzing's bestselling novel *Der Schwarm*/*The Swarm* (2004) serves as the hub for my analysis because it displays key characteristics that have been used to define cli-fi as a genre, such as a strong emphasis on science, technology, and disaster in a realistic setting. The other seven novels in my corpus are the spokes of my analysis as they answer the questions that arise from my readings of *The Swarm* differently and offer new avenues of thinking about the response-abilities of cli-fi.

Chapter One, entitled *Questions of Genre: Scientific and Poetic Modes of Cli-fi*, is the foundation for my broader approach to cli-fi as a literary genre that develops non-linearly and cannot be contained within a set of characteristics. After discussing some of the key challenges of imagining climate change in fictional texts and what this means for cli-fi as a genre, I propose a different way of framing the discussion. Differentiating between a scientific and a poetic mode, I

illustrate a more flexible understanding of cli-fi as a diverse and continuously evolving literary genre. First, I analyze the different ways in which scientific knowledge is conveyed in *The Swarm* to demonstrate how a 'typical' cli-fi novel deploys the scientific mode. The novel abounds with descriptions of specific aspects of planetary science, cell biology, and research from other scientific fields to explain how humans exploit the planet and to contextualize the apocalyptic events caused by an intelligent non-human species. Second, I turn to the narrative techniques in Margret Boysen's *Alice, der Klimawandel und die Katze Zeta/Alice, The Zeta Cat, and Climate Change* (2016) to consider the issues that arise when literature is used in the service of communicating science. The novel's main character, Alice, is a young girl who travels through a virtual world of climate models where she is taught about global anthropogenic warming by characters, such as Lady Celsius and Prince Carbon, who metaphorically embody scientific observations and calculations. Focusing on Boysen's use of personification to communicate climatological knowledge, my analysis of this novel points to a more problematic variant of the scientific mode. I contrast these two different examples of the scientific mode with Helene Bukowski's *Milchzähne/Milk Teeth* (2019). At the centre of this novel is the story of Skalde who writes about her life with her mother, Edith, in a fog-plagued region. This cli-fi novel evokes environmental change without using scientific language and without direct references to contemporary climate change discourse (ex. sea levels rising, modified weather patterns, increasing extreme weather events). It does, however, explore ways of coping with and adapting to hostile environments through its setting, characters, and descriptions of environments. This is what I am calling the poetic mode of climate fiction.

Chapter Two, entitled *Questions of Story: Representing Non-Human Agency and Relations*, focuses on ways of narrating plants and animals, as mediated through language. Having no single specific material form, climate itself must be imagined and narrated in terms of its effects.

Grappling with the issue of representability, the texts analyzed in this chapter employ specific formal and narrative strategies to tell stories about non-humans in less anthropocentric terms. In *The Swarm*, a fictional organism called the yrr that displays new kinds of intelligence pushes human-centred thinking to its limits. This forces humanity to resituate itself as one actor among many within the planetary ecosystem. I show how the text uses this organism to disrupt common understandings of matter and agency. To further examine non-human agencies in cli-fi, I provide close readings of two novels that focus on icebergs and water. Ilija Trojanow's novel *Eistau/The Lamentations of Zeno* (2011) follows the life of scientist Zeno Hintermeier and his affectionate relationship with Antarctic glaciers. My reading of this novel focuses on the problematic depiction of the non-human through Zeno's male gaze. In *Malé* (2020), Roman Ehrlich uses a postmodern lens to re-imagine the Maldives as an absurd space where touristic connotations of the tropical paradise are reversed, and water becomes an agent of climate change that escapes the world of the text. Using concepts from Bruno Latour and theories of new materialism, my close readings demonstrate how these cli-fi novels engage with the living world and approach the issue of narrating the non-human.

Chapter Three, entitled *Questions of Scale: Articulating the Local and the Global,* focuses on the literary development of place in the context of global crisis. It examines how cli-fi can articulate new possible meanings of place and place attachment in relation to the whole planet. Here, it is important to differentiate between the meaning of *global* versus *planetary* because these terms imply different ways of viewing the Earth as a whole. While a global perspective suggests a view from afar that places the viewer outside, the term planetary, as Horn and Bergthaller explain drawing from Ulrike Bergerman's work on *das Planetarische/the planetary*, "instead focuses on networks of interdependency and the technologies which produce them, particularly technologies

of communication" (11). Asking how cli-fi takes up the issue of these spatial scales, I first analyze how Schätzing develops a global perspective (at times in opposition to a planetary one), how the novel experiments with the local, the regional and the transnational, and also, surprisingly, offers an ocean-centred perspective. Next, I focus on Mirjam Wittig's *An der Grasnarbe/By The Sward* (2022), a novel that experiments with the trope of the pastoral to articulate a ruptured sense of place. Whereas *The Swarm* takes place in a global, cosmopolitan setting, Wittig's novel zooms in on how its main character experiences place and how global forces, such as terrorism or climate change, rupture her sense of place. Valerie Fritsch's *Winters Garten/Winter's Garden* (2015) explores the specific sense of place of individual characters who experience loss in the face of an imminent and slowly unfolding apocalypse. The novel imagines place through the lens of memory and contrasts a rural garden with an urban space. My analysis of these three novels reveals a space of culture that sits between the local and the global. The novels reject territorial and fixed notions of place and belonging and instead imagine a range of environments and experiences in response to a threatened or disrupted sense of place.

Chapter Four, entitled *Questions of Temporality: Developing a Human and Non-Human Future-Present,* presents my ecocritical analysis of Leona Stahlmann's *Diese ganzen belanglosen Wunder/All These Petty Miracles* (2022), a novel which explores different kinds of temporalities through its environmental imagination of wetlands. Stahlmann's novel foregrounds the marsh as a place where nature remains resilient, adaptive for the plants and beings that live there. It is also a medium for contemplating and creatively examining how climate change is affecting our notions of the future, our sense of hope, and our relationship with the living world. I focus on only one novel in this final chapter because Stahlmann's approach to imagining climate-changed temporalities illustrates particularly well how I see cli-fi as an evolving genre that promotes and

grapples with extremely complex environmental issues while also acknowledging the constraints of language that shape literature's response-abilities.

CHAPTER ONE

QUESTIONS OF GENRE:

SCIENTIFIC AND POETIC MODES OF CLI-FI

This chapter examines the ways in which cli-fi grapples with representing climate change as a scientific but also as a culturally constructed, and socially and politically mediated issue. What traditional or new literary forms do cli-fi texts use to address, shape, and renew our understanding and imagination of climate change? For Johns-Putra, questions of genre are particularly valuable for an ecocritical analysis of climate fiction texts. According to Johns-Putra, "genre theory, in dealing with the metatextual practices of authors as they write and readers as they read, and in exploring the links between these practices, recognises that literary endeavour takes place in the world" (*Ecocriticism, Genre, and Climate Change* 747). When literary scholars take an interest in the ways that literary writing reflects on the problem of representation and questions language as a transparent medium for factual information, they are acknowledging that writing acts as a lens through which reality is seen, constructed, and organized. This is particularly relevant for literary responses to climate change since fact-based scientific knowledge is central to how we understand this issue, and cli-fi thus faces the challenge of reconciling science-based perspectives with literary issues of representation.

My approach to questions of genre considers the literary practices used by authors of cli-fi to reflect on the role of science and further asks how these practices shape the text's mode. I will first outline the narrative challenges that the climate crisis presents and discuss the ways in which this complicates defining cli-fi as a literary genre. Second, I will use the concept of modes as a framework to discuss the role of science as a key element of climate change discourse in Frank

Schätzing's *The Swarm* (2004) and Margret Boysen's *Alice, Climate Change, and the Zeta Cat* (2016), and the role of writing as a coping mechanism in Helene Bukowski's *Milk Teeth* (2016). The concept of modes allows for understanding cli-fi as a fluid, hybrid, and evolving literary genre that responds to climate change across genres. I use the term 'mode' to refer to the different forms, methods, metatextual practices, manners, and styles in cli-fi that emerge in response to an ongoing crisis and the challenges it poses. Rather than defining cli-fi through a fixed set of characteristics, I examine the elements that make up its modes, and so contribute to a more nuanced understanding of cli-fi as a constantly evolving genre. My analysis will demonstrate how each text deploys a specific mode to imagine the climate crisis, using different kinds of narrative strategies and metatextual practices to engage with the scientific anchoring of climate change discourse.

I. Defining cli-fi as a literary genre: narrative challenges and cli-fi modes

The representation of climate change in literature challenges anthropocentric conventions of storytelling. It requires a closer look at scale, temporality, and the relationships between humans, other species, and the environment. According to Trexler, the complexities of climate change alter the capabilities of literary works and conventional narrative techniques, particularly within the novel:

> In the face of these challenges, climate novels must change the parameters of storytelling, even to draw on the tropes of recognizable narratives. More often than not, the narrative difficulties of the Anthropocene threaten to rupture the defining features of the genre: literary novels bleed into science fiction; suspense novels have surprising elements of realism; realist depictions of everyday life involuntarily become biting satire. (*Anthropocene Fictions,* 14)

The concept of the Anthropocene disrupts literary writing in ways that make it difficult to identify specific patterns of genre. Drawing from Trexler's point that "novels about the Anthropocene cannot be easily placed into discrete generic pigeonholes" (*Anthropocene Fictions,* 14), I

understand cli-fi as a fluid collection of texts that intervene within genres and create hybrid narrative forms in response to the different sets of problems that occur when literature imagines climate change.

Embedded within broader socio-political discourses, cli-fi is receptive to the ways in which conceptions of the climate crisis evolve and shift over time. Juha Raipola highlights that cli-fi is greatly influenced by cultural perspectives on environmental issues: "Born as the unfortunate love child of global environmental crisis and narrative imagination, climate fiction is a timely cultural reaction to the growing societal awareness of human impact upon the planet and its climate system" ("Speculative" 7). It is in this way that cli-fi critiques, incorporates, and offers new perspectives to our collective imaginary. Contemporary literary works that coincide with the ongoing public discourse on the global environmental crisis integrate information about climate change within narratives that envision and speculate on potential scenarios in worlds altered by climate change, without being constrained by the factual limitations of non-fiction writing. These texts can provide readers with story worlds and characters that lead them to consider possible climate-changed scenarios. Deeply connected to our relationship with the living world, the processes in and outside the text shape cli-fi novels, resulting in multiple possible notions of what it constitutes as a literary genre.

I agree with Adeline Johns-Putra and Kelly Sultzbach, who suggest that "climate change literature's primary characteristics are less foundational properties than they are reactive elements" (10). I view the evolution of cli-fi as non-linear and approach questions of genre from an ecocritical perspective, situating literary writing within the multiple relations between different material realities, social discourses and the collective imaginary of climate change. Cli-fi participates in "practices that systematically form the objects of which they speak" (Foucault 49). At the same

time, genre can be an open concept as "responses" to recurring situations (Bawarshi 73) that are always in flux, always evolving in relation to other texts. Climate discourses are themselves changing in response to scientific, political, and public knowledge claims.

In dealing with a complex scientific, cultural, and ecological problem, cli-fi often blends scientific facts (logos) with affective responses to (pathos) and moral consequences of (ethos) the climate crisis. As Manjana Milkoreit emphasizes, "even making scientific information meaningful requires imagination, because many scientific concepts […] are abstract and not perceivable with the human senses." (166) By drawing attention to the problem of representation, metatextual practices critically reflect on the ways in which cli-fi texts respond to climate change as a scientific problem. On the one hand, the sciences play a prominent role in cli-fi novels like *The Swarm* and *Alice, Climate Change, and The Zeta Cat.* These texts emphasize 'factual' aspects and directly place scientific knowledge in their story worlds. On the other hand, the absence of the sciences in cli-fi texts like *Milk Teeth* points to the problem of only using the sciences to understand climate change and considers the role of the poetic in imagining climate-changed worlds.

Rather than thinking of cli-fi as a system of classification or as a set of forms defined by reader expectations, I examine the kinds of modes that literature develops in response to the narrative challenges of representing climate change. Goodbody has identified three different modes of cli-fi, drawing from the research of other cli-fi scholars: an apocalyptic mode that functions as a cautionary tale, a pastoral mode that cultivates a sense of grief and draws attention to what is lost to spark resistance, and a satirical mode that uses humour and irony to point out the contradictions between knowledge and behaviour (*Genre of the Twenty-First Century*, 133-35). Like Goodbody, I find it helpful to organize cli-fi around modes because they can take on different iterations or morph into each other and can appear in any genre, whereas genre conventions are

less flexible and tend to stay within clear, defined boundaries. However, Goodbody's modes relate cli-fi back to common tropes, such as the apocalypse or the pastoral, which can potentially limit them to the specific characteristics tied to these tropes, placing them within yet another set of criteria.

My approach to mode is similar to Stephanie LeMenager's understanding of cli-fi as a novelistic mode that acknowledges "cli-fi across genres and media as a symptom of a social need," (222). By responding to the need to find new ways of making sense of a crisis that radically transforms our world, cli-fi imagines and explores these transformations without necessarily adhering to one single genre. LeMenager further explains that she is interested "in mode as 'a method, a way of getting something done,' in the words of the science fiction scholar Veronica Hollinger, who sees sci-fi in particular as less a genre than a way of living in the world" and argues that cli-fi "marks another way of living in the world—a world remade profoundly by climate change" (222). Although LeMenager examines this novelistic mode through distant reading whereas I use close reading, a specific concern for cli-fi's desire to make sense of climate-changed worlds is central to understanding cli-fi as mode. Much of this 'making sense' emerges from the role of scientific knowledge because it dominates how climate change is understood. At the same time, it is not the only way that literature responds to this crisis. Thus, I propose two modes – the scientific and the poetic – in this chapter.

The scientific mode refers to cli-fi texts that explicitly communicate climate science by weaving it into their story worlds (i.e., through the figure of the scientist or descriptive passages that feature scientific information). This mode is especially relevant for cli-fi written in the early 2000s when the term cli-fi was coined, and texts were marketed as cli-fi by publishers (i.e., Kim Stanley Robinson). The fact that these texts are automatically labelled 'cli-fi' (echoing the short

form ‘sci-fi’) means readers connect this genre to previous genres like science fiction, in which science and technology drove the narrative arc. While Schätzing’s novel is indebted to science fiction, Boysen’s is very much not. I will analyze the ways in which the scientific mode takes on different forms in these two novels, ranging from using literature to teach readers about scientific facts to revealing the interactions between science, politics, and different audiences. I will not only ask how these novels incorporate the sciences, but also to what extent they critically reflect on potential issues that arise when doing so.

The poetic mode narrates climate-changed worlds by exploring the affective dimensions of the climate crisis without including scientific elements related to this crisis. Cli-fi texts that employ this mode focus on how our understanding of climate change translates into the experiences and stories of individuals in relation to the environments they live in and the species they live with. Lacking climatological facts, these texts build on the social imaginary of climate change discourse and develop non-scientific vocabularies to narrate the stories of climate-changed worlds as, in LeMenager’s words, “marking another way of being in the world” (222). The poetic mode recognizes language and writing as anthropocentric ways of making meaning, but also as powerful tools to cope with the effects of climate change and to sit with, mourn, and adapt to the transformations that emerge in the Anthropocene. In *Milk Teeth*, climate change is conveyed in exactly this way. The novel reflects on the act of writing as a way of creating meaning in a world shaped by environmental and social decline. In contrast to Schätzing and Boysen, who primarily present scientific knowledge and educate readers in their novels, Bukowski explores the emotional landscape of living in a world where extreme weather patterns shape the everyday of the novel’s protagonists. I suggest that one of the ways in which Bukowski shows how literature can imagine

climate change is by creating literary atmospheres that evoke climate change as a tone rather than a scientific phenomenon.

The three novels that are analyzed in this chapter illustrate the scientific and poetic modes of cli-fi. Starting with an analysis of the relationship between science and literature in *The Swarm*, I will carve out the specificities of the scientific mode.[8] Turning to Boysen's novel *Alice, der Klimawandel und die Katze Zeta/Alice, Climate Change, and the Zeta Cat*, I will discuss another iteration of the scientific mode. Driven by a pedagogical approach to break down complex scientific information, the scientific mode of Boysen's novel is primarily concerned with using literary strategies in the service of science. This novel is not an example of the poetic mode because its story revolves around climatology and appeals to cerebral knowledge and logical thinking. Yet, it does not sit firmly within the scientific mode because the text narrates this scientific knowledge through figurative language and maps it onto the world of Alice, a literary character from Lewis Carroll's novel *Alice in Wonderland* (1865). I will analyze how Boysen employs literary devices such as personification, metaphor, and intertextual references to teach the reader about climatological knowledge such as modelling or tipping points. Lastly, close readings of Bukowski's *Milk Teeth* will serve as examples of the poetic mode. Here, I adopt the critical concept of literary atmospheres or *Stimmung* to frame some of my close readings and nuance my analysis of the poetic mode in the novel.

[8] However, as my close readings in Chapter Two will show, the two modes sometimes blend into each other, and Schätzing occasionally diverts from the scientific into a more experimental mode that is closer to the poetic and attends carefully to language's potential to convey alternative views of the world. The novel adopts a scientific mode that builds on frameworks familiar to readers of sci-fi, such as a speculative approach to imagining alien deep-sea creatures. As I will discuss later, however, Schätzing's pairing of scientific prose and fictional elements creates an interesting tension.

II. Writing to entertain: the scientific mode in *The Swarm*

In *The Swarm*, a highly intelligent non-human species residing in the ocean rebels against humans, causing global catastrophes that endanger human existence on Earth. The novel fits common descriptions of cli-fi[9] particularly well because it imagines climate change through the lens of science, features characters who are scientists, adopts a Western worldview of science as crucial to understanding organisms and their environments, and uses the apocalyptic imagery of the natural world taking revenge on humanity to create a sense of urgency for the reader. For German literary scholar Gabriele Dürbeck, the novel is part of German ecothrillers that "are plot-centred ecologically themed stories determined by conventional patterns," and "characterized by a genre-mix of science fiction, thriller, and docu-fiction" (337). My reading of the novel[10] in this chapter focuses on the novel's scientific mode and the ways in which Schätzing incorporates scientific research on the natural world to entertain readers and educate them about the dangers of destructive human behaviours. First, I will examine the ways in which the novel communicates scientific facts and theories to different audiences, then how it presents science as a discourse in relation to industry and politics, and finally, I will analyze the tensions that arise when science is placed in a literary text.

The novel abounds with descriptions of specific aspects of planetary science, cell biology, geoscience, and research from other scientific fields to explain how humans exploit the planet

[9] Although the novel is sometimes labelled as science fiction, its heavy focus on climatology and environmental collapse in a present-day setting allows it to be considered as cli-fi. The novel is an excellent example of the ways in which sci-fi and cli-fi overlap, but also demonstrates the specificities of cli-fi as a genre that is specifically concerned with the environment and the effects of climate change whereas sci-fi texts explore a broader range of topics.

[10] I will only quote from Sally Ann Spencer's English translation of the novel throughout the dissertation because Schätzing's text focuses less on the specificities of language than the other novels in my corpus, and its numerous translations circulate in a broader international context.

(e.g., the mining of methane gas in the ocean) and to contextualize the apocalyptic events caused by the yrr, an imaginary single-celled organism that takes decisive action against this exploitation.

Passages from presumably non-fiction sources, such as the "Annual Reports of International Environmental Organizations," and CNN news stories, remind readers of the realities of climate change outside of the text, realities to which the text is responding. By making real-life people and institutions, like the German scientist Gerhard Bohrmann and the Geomar Center for Ocean and Marine Research, part of its story world, the text blends fictional and non-fictional elements. Institutional settings frame descriptions of the scientific processes that underlie the environmental concerns addressed throughout the novel.

Readers gain access to multidisciplinary research from the perspective of scientists as they engage in public scholarship, exchange information, work in collaborative networks, and face moral dilemmas. As relatable characters, scientists function as mediators who communicate dense research that is crucial to understanding the complexity of climate change. Schätzing constantly weaves chunks of scientific knowledge from multiple fields into the narrative. In this way, he places science in a position of authority when it comes to understanding the complexities of the climate crisis. Readers trust that science can provide the answers. Given the amount of science and scientific knowledge conveyed in the novel, I will focus on one area, that of methane. As one of the additional gases contributing to global warming, methane is often feared as what will take us well beyond the planet's tipping point into uncharted, terrifying futures. The novel goes one step further, imagining a world in which methane becomes the next exploitable natural resource.

Methane hydrates and the negative impact of an increased release of methane on the planet's climate are central to the ways in which the novel imagines future climate-change scenarios. Throughout the text, this complex topic reappears, broken down into chunks using

simple language. By showing engagement with the broader public outside academic settings as part of the work of scientists, the novel points back to its own practice of communicating scientific knowledge to lay audiences. In a talk to high school students, for example, geologist Gerhard Bohrmann uses comparative examples (methane hydrates "act like cement" as they "hold the continental slopes together" 256) and simile ("If you took away the hydrates, the slopes would look like Swiss cheese." 256) as he explains to students the process of exploring ocean beds and the significance of methane gas mining as a future energy source. Sigur Johanson, a marine biologist working at the Norwegian University of Science and Technology, summarizes the conditions under which methane hydrates occur in the ocean first using simple terms when speaking with people outside the academic community:

> Well, methane is a gas. It's stored in vast quantities beneath the ocean floor and in the continental slopes. Some of it freezes on the surface of the seabed – it combines with water to form ice. It only happens in conditions of high pressure and low temperature, so you have to go pretty deep before you find it. The ice is called methane hydrate. Does that make sense? (106)

His descriptions of methane continue over several pages, and he is repeatedly asked to explain scientific jargon (e.g., "isotope ratio mass spectrometry," 192). The novel conveys scientific information to help the reader understand the complexity of scientific processes, and readers can build on this knowledge as the narrative progresses. Including an excessive amount of factual information and lengthy descriptive passages, however, slows down the narrative and limits the text to a pedagogical approach. This approach uses the literary text only as a tool to present scientific knowledge as fact, without acknowledging that the text is itself a reconstruction of science within a literary context.

At the same time, the novel reveals the many ways in which the sciences are entangled with politics and capitalist industry. Bohrmann, being consulted by someone who works for an oil company, describes the marriage between science and industry:

> Research is in the hands of big business. The only reason that you and I are on this boat is because Statoil found a worm. The state can't pay for science, so the money comes from industry. There is no science for the sake of enquiry, these days. This worm isn't an object of scholarly interest. It's a problem they want us to get rid of. Science always has to have an immediate application – and, preferably, one that gives industry free rein. (213)

At times, the novel exposes how the sciences are caught up in capitalist industry; at other times, it promotes the idea of science as an authoritative source of knowledge that presents objective perspectives and factual information.

Detailed descriptions of research institutions address the ways in which the sciences have been forced to take a political position in the context of the climate crisis. Several pages are dedicated to "the Geomar Centre, Europe's leading research centre for marine geosciences" (246) in Kiel, Germany. An omniscient narrator further contextualizes and comments on the relationship between scientists and the broader public:

> Now they tried to make themselves heard. They hoped to develop methods for predicting and averting natural disasters and long-term changes to the environment and climate. Methane seemed the answer to the energy problem of the future. The media sensed a story, and the geoscientists learned gradually how to make use of the new-found interest in their work. (246-247)

A brief overview of the institute's history and relevance for climatology and climate-change mitigation shifts into a discussion of the broader implications of its work and relationship to the public, explaining that "it was time for the geosciences to break out of the seclusion in which they, like most other scientific disciplines, had worked" (246). In addition to presenting scientific knowledge in accessible language, the scientist characters Bohrmann and Johanson allow

Schätzing to explore questions about the perception and role of science in the public eye and the issue of communicating academic findings to a lay audience. The scientists' conversations and reflections about their work in relation to the public mimic what the novel itself sets out to do: "break out of the seclusion" (246) and communicate scientific research to a broader audience. The need to make this research more accessible and to collaborate with the public and other industries is addressed at several moments in the novel. For example, in a conversation with Bohrmann, Johanson explains that "science has encapsulated itself in its universe most of the time" (132). He is critical about the relationships of the sciences to other sectors, such as private industries, the military, or oil companies, stating that "everyone doesn't talk to each other enough" (132). Here, the novel begins to map out how scientific research participates in sociopolitical discourses.

The novel addresses the capitalist interests of oil companies and political structures that surround the scientists and the ways in which industries have benefited from their work. In these passages, science is no longer presented as objective, but as entangled in economic and political systems, which further exposes different layers of climate change as a highly charged discourse. According to Goodbody, this is a common feature of cli-fi novels:

> Climate novels have explored issues relating to the uncertainty of climate science, the openness of scientific practice to economic interests and political manipulation, the role of media in subjecting the state and industry to public scrutiny, the efficacy of protest action environmental justice, and personal responsibility. (*Telling the Story of Climate Change* 303)

In *The Swarm*, it is the oil company Statoil that consults and hires scientists to evaluate the risk of a strange species of deep-sea worms interfering with the company's methane mining projects in the ocean. In the second part of the novel, an international scientific task force led by the United States works together to find solutions for the disastrous events caused by the sea worms. Here,

the focus starts to shift from science to the role of politics, nationalism, and anthropocentric belief systems.[11]

Critical perspectives start to emerge as the scientists struggle with ideologies of human mastery of the planet. Bohrmann's reflections on the use of technology to explore and exploit marine environments present science in a more critical light than his lecture about methane to high school students, showing his ambiguous feelings towards using science for capitalist exploitation. As he looks at a deep-sea simulation chamber, he thinks of technology's role in the "taming of the ocean" (228) and the scientific practice of creating an "idealised copy of the real thing" (228) to expose non-human environments to a dissecting scientific gaze. While Bohrmann is excited about the potential of new technologies for scientific discovery, he is also concerned about the blind spots of scientific research "imitating life rather than analysing it" (228). His critical reflections point to shifting perspectives from science as a way of understanding the world to science as human intervention, socio-political discourse, and manipulation of the world. This is further reflected in his thoughts about the erasure of the potential dangers of using science to intervene within the planetary ecosystem:

> Understanding the planet was no longer enough for most people; they were intent on trying to change it. In the Disneyland of botched science, human intervention was forever being justified in new and disturbing ways. He was struck by the same thought whenever he came here: they could never tell for sure what science might achieve, only what it should never have attempted — and no one wanted to hear about that. (228)

This scene confronts readers with the dangers of idealizing science as the driving force of human progress without paying attention to the destruction of environments causing irreversible damage.

[11] As I will address in Chapter Two and Chapter Three, this is particularly important for the human-nature discourses that shape the novel's depiction of the non-human and the tension between a sense of place and a sense of planet that arises in the text.

It foreshadows the theme of the natural world rising up to seek revenge for the destructive behaviours of the human species which is essential to the novel's narrative arc.

The novel uses the scientific mode to present a significant number of scientific facts as 'objective' knowledge and to weave in various aspects of science, such as the role of scientists, their research, communication with lay audiences and among themselves, and their critical thoughts on how their work is used for capitalist interests. However, it also criticizes the relationship between science and industry, which seems to contradict the text's reliance on science as single master discourse. Incorporating science in these various forms can be confusing, and it is unclear whether the novel critiques science as a politicized discourse when it uses cli-fi as a form of science communication. However, the novel presents science primarily in terms of the needs of the story, propelled by its drama and action. I suggest that the novel critiques the role of science as part of its 'infotainment' value, as the conflicts between science, capitalist industries, and political interests contribute to the text's drama and suspense. Ultimately, I would argue that the novel dramatizes science to entertain readers while also using science as a source of factual knowledge about the natural world.

III. Writing to educate: the scientific mode in *Alice, The Zeta Cat, and Climate Change*

The main character in Margret Boysen's novel *Alice, The Zeta Cat, and Climate Change* (2016, not yet translated into English)[12] is a young girl named Alice who learns about climate change as she enters the scientific world of computer models at the Potsdam Institute for Climate Impact Research (PIK). Much like *The Swarm,* the text promotes a pedagogical approach to communicating science to lay audiences. Throughout the novel, Alice learns about different

[12] All English quotes from the novel in this chapter are my translations, with the German original in the footnotes.

aspects of climate change (e.g., the role of greenhouse gases or the concept of tipping points) and gains a deeper understanding of climatology. In contrast to *The Swarm*, where the figure of the scientist appears in complex political settings, the scientist characters in this text are first and foremost presented as trustworthy sources of knowledge and mediators who educate the public about their contributions to climate change mitigation. While Schätzing incorporates scientific knowledge from various disciplines into his novel through dialogues and third-person narration, Boysen's novel imagines science within a virtual reality, where Alice encounters characters who embody important climatological concepts. In contrast to *The Swarm,* where science is presented as part of a narrative of human mastery through technology, *Alice* focuses on science as a driver of change and promotes the collective work of scientists to mitigate climate change and educate the public.

The novel is an example of a cli-fi text that employs a slightly different type of scientific mode than *The Swarm* because it creates a fictional world where complex scientific facts are characters. Presenting science as the key to 'resolving' environmental problems, it does not reveal or critique the marriage between science and industry nor address climate change as part of an apocalyptic revenge narrative, as is the case in *The Swarm*. Instead, Boysen uses the literary device of personification and Lewis Caroll's story of Alice as frameworks[13] to create a story about the purpose of climate modelling. Her training as a scientist and background in scientific journalism, climate outreach and education influence this approach to literary writing. She studied geology and paleontology and currently works as the Public Relations Manager and Artistic Director of the PIK, where she leads the Artist in Residence Program, a program that facilitates exchange between

[13] However, the intertextual engagement with Caroll's story remains quite superficial. Boysen prioritizes the scientific, so that familiar storylines, such as Alice entering a fantasy world through a rabbit hole, are reduced to the role of conveying complex climatological concepts.

the arts and sciences. *Alice* is her first novel and part of her efforts to restore the public's trust in the scientific community in the face of climate change skepticism and to make research in climatology more accessible to the broader public. In interviews, she explains that realizing that "science itself stood on the brink of credibility (…) the issue of guilt and fear, and the realization that feeling responsible for a huge potential environmental disaster like global anthropogenic warming is rather too much to deal with for the human brain" prompted her to write "something people would not immediately shy away from because they felt overwhelmed" (Boysen, interview). As a scientist, who seeks to convince the public of the value and credibility of the sciences, she deems it more effective to weave scientific knowledge about climate change, and more specifically about climate modelling, into an entertaining fictional narrative than depicting environmental disasters as a story that evokes negative feelings.[14] My analysis of the novel will show how intertextuality is key to its scientific mode. In addition, I will critically examine how this cli-fi novel endows scientific concepts with new meanings by using literary devices, such as personification. What are the limitations of narrating scientific concepts as fantastical elements in a fictional story to inform readers about climatological research?

Although the novel personifies scientific concepts, this fictionalization is heavily grounded in scientific theory. The novel includes 44 pages of endnotes with detailed explanations of the scientific references and footnotes that list the academic publications from which the text draws. The annotations at the end of the novel provide more information about scientific terms or processes (i.e., thermodynamics), important scientists and their research in different fields (i.e., astronomer Johannes Hartmann or natural scientist Charles David Keeling), details about specific

[14] Boysen's short publication, entitled "A Cold Case Turns Hot. The Potsdam Institute for Climate Impact Research Investigates" (2017), is another example of the ways in which this author tries to educate the public and communicate the work of climatologists in accessible ways through storytelling and illustrations.

climate models (i.e., the REMIND-model), and more context about the references in the novel (i.e., wordplays or quotes from other literary texts). Mixing different kinds of information, the annotations take on an encyclopedic form, which further illustrates Boysen's attempt to create a space where climate modelling is situated within a broader context. She uses the novel's paratext to provide the necessary scientific context for the fictional narrative (i.e., the character of Prince Albedo represents the scientific term Albedo to describe the amount of energy reflected by a surface) and as a reference to the authoritative voice of scientific academic discourse (i.e., citations of scientific papers). In this way, the novel blends scientific thinking with literary writing differently than other cli-fi texts like *The Swarm* that use scientist characters and long descriptive passages to present scientific knowledge in a realistic way.

The novel starts with Alice listening to her physics teacher explaining the PIK's significance on a school trip. As the teacher lists the names of renowned scientists who have conducted research at the institute, the reader encounters science within an institutional context. Climatology is immediately associated with a specific institution, and the fact that the institute welcomes visitors illustrates efforts to share scientific knowledge with audiences outside academia. In a conversation with Alice, Matthias, one of the scientists working at the institute, explains that the PIK is a member of the Leibniz Association, which means that it is committed to "conducting research on issues of interest to society as a whole" and to "informing citizens and decision-makers about research outcomes" (17).[15] The story of Alice learning about this research as she enters a virtual reality where mathematical computer models come to life as characters mirrors this mandate to disseminate information about the scientific research process.

[15] "Leibniz-Institute forschen zu Fragestellungen von gesamtgesellschaftlichem Interesse und haben den Auftrag, Bürger und Entscheidungsträger über ihre wissenschaftlichen Ergebnisse zu informieren." (17)

When Matthias explains the use of climate modelling to Alice, he emphasizes the importance of "figures of thought" and "mathematical-physical models" in response to the challenge of representing "climate" (18),[16] a phenomenon that is experienced as weather. These figures of thought ("Denkfiguren") point to the parallels between science and literature. Matthias elaborates that the Earth system is ruled by mathematical equations, which govern their territories like kingdoms, and that they constantly face different tasks as the climate changes. This points to a shift in the text's scientific mode from descriptive (e.g., the physics teacher) to metaphorical to explain scientific concepts. The imaginary space of the computer model that Alice enters functions as a network of figures of thought, breaking down complex scientific processes and calculations into short narrative segments. Inspired by Carroll's novel *Alice in Wonderland*, the novel imagines a wonderland of multiple climate change scenarios and blends mathematical thinking with the use of literary devices like metaphor, figurative language, or analogy. Outcomes of contemporary research in climatology (e.g., the use of advanced computer models to study the Earth's icing dynamics) are presented as a story of curiosity and adventure.

The text uses two kinds of characters to convey how climate models work and their contributions to climate change mitigation efforts: literary characters and personified scientific concepts. Both types of characters are central to the novel's scientific mode because they function as mediators, either embodying a complex scientific concept or using figurative language in their explanation of these concepts.

As Alice enters the virtual reality of climate models, the fictionalization of science begins, and she learns that "every part of the Earth system is governed by mathematical equations that rule their empires like kings. But kings don't just doze off. With the climate changing, they have a lot

[16] "Wir arbeiten vor allem mit Denkfiguren und mathematisch-physikalischen Modellen – weil man das Klima nicht anfassen kann, sondern es nur in Form von Wetter erleidet." (18)

of responsibilities and there's always a hustle and bustle" (19).[17] Equations, chemical elements, and natural phenomena 'come to life' as personified characters who appear in relation to each other and the Earth system. At first, Alice stands in for a lay audience, but as she starts learning from other literary characters, like the Zeta Cat, who is modelled after Carroll's Cheshire Cat, she becomes more knowledgeable and is asked to share her knowledge at "the climate conference of animals" (183).[18]

The character of the Cheshire Cat becomes particularly relevant for the novel's intertextual strategies that are key to its scientific mode. The Zeta Cat combines mathematical thinking with the literary imagination and has the ability to explain any scientific concept in simple, accessible language. For example, Zeta uses waterfalls as a metaphor to explain the concept of tipping points. The cat tells Alice the story of various kinds of animals navigating the currents of a river in different ways, depending on their abilities, to illustrate how each part of the planetary ecosystem responds to and recovers differently from changing temperatures:

> "Let's use a geocybernetic metaphor. Imagine a monkey, a rabbit, a deer and a beetle going down the river in a boat. [...] Suddenly the boat comes to a place where the river forks. The current is getting stronger and the animals have to decide quickly where to row. [...] This is called path dependency or 'hysteresis': none of the animals comes back up the waterfall as quickly as it came down. And every animal takes a different amount of time. The waterfall was a tipping point for them." "And on Earth?" Alice asked. "It's the same," Zeta replied, "each system takes a different amount of time to recover. In order for the Greenland ice sheet to become as thick as it was before global warming, much lower temperatures than prevailed in the Holocene are needed. This path dependency is known in the earth system and in ordinary life." "And what does all of this have to do with the 2 degree limit?" "Schellnhuber found out that mankind finds itself in an area with a particularly large number of waterfalls when it warms the earth's atmosphere by more than 2 degrees Celsius. That's why he made a world map of possible tipping elements... like when you map a river and draw its falls." (118-20)[19]

[17] "Jeder Teil des Erdsystems wird von mathematischen Gleichungen beherrscht, welche ihre Reiche wie Könige regieren. Doch die Könige dösen nicht einfach vor sich hin. So wie das Klima sich verändert, haben sie jede Menge Aufgaben, und es herrscht ständig Trubel." (19)

[18] "die Klima-Konferenz der Tiere" (183). This scene is modelled after the Mad Hatter's tea party in Caroll's story.

[19] "Nehmen wir eine geokybernetische Metapher. Stell dir vor, ein Affe, ein Hase und ein Käfer fahren in einem Boot einen Fluss hinab. [...] Das nennt man Pfadabhängigkeit oder auch Hysterese: Keines der Tiere kommt so schnell den

The image of the waterfall and the different forks in the river serve as metaphors for tipping points and the concept of hysteresis.[20] The significance of tipping points is conveyed through the literary genre of the fable. Zeta, the speaking cat, uses storytelling as a teaching method multiple times.[21] After listening to Zeta's story about three men in a row boat approaching a waterfall and navigating unpredictable river streams, Alice experiences a eureka moment. She understands how climate modelling is used to determine tipping points and realizes that "the men need math eagles to reconstruct the landscape and know where the canyons are. They would have to calculate the lines of force of current and wind at many points in the river" (157).[22] Mathematics is presented as a tool to visualize and locate the waterfalls. Complex scientific information is embedded in short vignettes like the fable-like story of the animals on the river and Zeta concludes that "mathematics and poetry are two kinds of seeing" (157).[23] This is central to how the novel deploys a scientific mode that combines the logic of science with techniques of literary storytelling.

Throughout the novel, Boysen uses the literary device of personification to create stories that help readers understand complex information about climate modelling. For example, Alice meets the Sun King, who explains the rules of his kingdom to her using simple language. He

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Wasserfall wieder hoch, wie es ihn hinuntergekommen ist. Und jedes Tier braucht unterschiedlich lange, bis es sich wieder erholt. Der Wasserfall war ein Kipp-Punkt für sie." "Und auf der Erde," fragte Alice. "Ist es das Gleiche," antwortete Zeta. "Jedes System braucht unterschiedlich lange, bis es sich wieder erholt. Um den grönländischen Eisschild wieder so dick werden zu lassen wie vor der globalen Erwärmung, braucht es viel tiefere Temperaturen, als im Holozän herrschten. Diese Pfadabhängigkeit kennt man im Erdsystem und im ganz gewöhnlichen Leben." "Und was hat das alles mit der 2-Grad-Grenze zu tun?" "Schellnhuber fand heraus, dass sich die Menschheit in einen Bereich besonders vieler Wasserfälle begibt, wenn sie die Erdatmosphäre um mehr als 2 Grad Celsius erwärmt. Deswegen hat er eine Weltkarte möglicher Kippelemente erstellt…, so als wenn du einen Fluss kartierst und seine Wasserfälle einzeichnest." (118-20)

[20] In climatology, this concept refers to "a reliance of the state of a climate system on its history" (Mondal et.al. 2).

[21] Here, the novel requires readers to pause and consult the paratext, which creates a tension between the novel's role as a literary text and its use as a pedagogical tool.

[22] "Die Männer brauchen also Mathematik-Adler, welche die Landschaft rekonstruieren und Wissen, wo die Schluchten sind. Sie müssten an vielen Punkten im Fluss die Kraftlinien von Strömung und Wind berechnen. (157)

[23] Mathematik und Poesie sind zwei Arten des Sehens." (157)

teaches Alice about the relationship between the sun and the planet and introduces the concept of Milankovitch cycles, which describes how the Earth's position relative to the sun affects the long-term climate on Earth:

> I'm sorry, little girl, but in the northern hemisphere the sun continues to decrease and the snowpack is getting thicker. The summers are too short and the slanting rays of the sun too weak to melt the snow. The Ice Age only ends when the Earth's orbital parameters change in such a way that the summers in the northern hemisphere become significantly warmer and longer again. At least that is the constitutional requirement. A great deal of geostrategic skill is required for an ice age to end in the model as well. Only if the scientists do everything right will the ice melt ten times faster than it came. (24)[24]

This passage addresses the issue of scales, which is one of the challenges faced by cli-fi novels. It takes a long-term perspective to explain that climate has always been changing without portraying global warming as 'natural.' The Sun King uses familiar examples, such as seasons and weather patterns, to explain the collective effects of changes in the Earth's movements on its climate. This chunk of scientific knowledge reappears in the text when Alice meets the Grand Duke Albedo, who embodies the quantifiable ratio of reflected to incoming solar radiation. He talks to Alice about his relationship with the Ice Princess and Prince Folio, who represent the snow-covered and green parts of the Earth's surface, respectively:

> The liaison with the Ice Princess is purely mathematical! Once Prince Folio has greened the northern hemisphere, I will help him just as I helped her before. Then I will calculate how much heat from the sun is absorbed by the green surface of the earth and implement this changed radiation balance by virtue of my office. But as long as there is snow, I have

[24] "Es tut mir leid, kleines Mädchen, aber die Sonneneinstrahlung auf der Nordhalbkugel nimmt zunächst weiterhin ab, und die Schneedecke wird noch dicker. Die Sommer sind zu kurz und die schräg einfallenden Sonnenstrahlen zu schwach, um den Schnee zu schmelzen. Die Eiszeit geht erst zu Ende, wenn sich die Erdbahnparameter so ändern, dass auch die Sommer auf der Nordhalbkugel wieder deutlich wärmer und länger werden. Das ist zumindest die verfassungsrechtliche Vorgabe. Viel geostrategisches Geschick ist nötig, damit eine Eiszeit auch im Modell endet. Nur wenn die Wissenschaftler alles richtig machen, wird das Eis zehnmal so schnell gehen, wie es gekommen ist. (24)

> to ensure that heat is reflected back into space. It's required by radiation laws, and that's why I'm wearing this coat. Its surface is a kind of calculating mirror. (50)[25]

The duke's job is to calculate the amount of heat from the sun that the earth's surface absorbs. Describing his relationship with the Ice Princess as "purely mathematical" (50)[26] points to the scientific fact that snow has a greater capacity to reflect light and, therefore, a higher Albedo than green environments. Instead of actual scientists, the text relies on personification and uses multiple 'royal' fable figures to present scientific knowledge. This use of personification complicates the scientific mode because the role of these figures within the novel relies on the information provided in the endnotes. Although this factual section of the novel is kept separate from the fictional narrative, it adds important information that is necessary for understanding Boysen's scientific mode.

Boysen also uses other literary devices, such as analogy or metaphor to teach readers about climate modelling. For instance, the dress worn by the Ice Princess stands in as an additional example to illustrate the relationship between snow and solar radiation, also known as the Albedo effect:

> The Grand Duke Albedo gave it [the dress] to me! Imagine, except for the back yoke made of Atlas snow, it's made of fresh snow. I don't know of any dress that reflects the heat of the sun better than this one! The colder it is, the bigger and more beautiful it gets. And the nicer and bigger it is, the colder it gets. (28)[27]

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[25] Die Liaison mit der Eisprinzessin ist rein rechnerischer Natur! Sobald Prinz Folio die Nordhalbkugel mit Grün bedeckt hat, werde ich ihm genauso helfen, wie ich vorher ihr geholfen habe. Dann werde ich ausrechnen, wie viel Wärme der Sonner von der begrünten Erdoberfläche aufgesogen wird und diese veränderte Strahlungsbilanz kraft meines Amtes implementieren. Solange aber Schnee liegt, muss ich dafür sorgen, dass Wärme ins Weltall zurückgeworfen wird. Das verlangen die Strahlungsgesetze, und deswegen trage ich diesen Mantel. Seine Oberfläche ist eine Art Rechenspiegel." (50)

[26] "rein rechnerischer Natur" (50)

[27] "Der Großherzog von Albedo hat es mir geschenkt! Stell dir vor, bis auf die Rückenpasse aus Atlas-Schnee ist es aus reinstem Neuschnee. Ich kenne kein Kleid, das die Wärme der Sonne besser zurückwirft als dieses! Je kälter es ist, desto größer und schöner wird es. Und je schöner und größer es ist, desto kälter wird es." (28)

The dress is made from snow and, therefore, perfectly reflects the sun. If temperatures rise, the dress gets smaller and reflects the sun less efficiently, which leads to warmer temperatures. Building from these mini-lessons about the specific Earth system processes involving the sun, the novel introduces other royal characters who take on a significant role in the ways we imagine climate change. Here, Boysen builds on terms and concepts that are familiar to a lay audience, such as the impact of the amount of carbon dioxide in the atmosphere on the planet's climate. However, the text is filled with references that only make sense when readers consult the paratext, and the fictional story is reduced to a pedagogical tool, which impedes readers from connecting this knowledge to other-than-scientific aspects of climate change.

Part of the problem with the scientific mode in this novel may arise from the fact that climate models are complex systems with so many moving parts. Boysen combines mathematical and literary approaches to create a fictional story world that emerges from the results of decades of research in climatology. Climate change models are important for understanding and visualizing something as abstract as climate change. As Paul Edwards explains:

> Only by coupling statistical analyzes to climate modeling exercises have scientists been able to isolate and display the 'fingerprint' of global warming in changing weather patterns around the world. […] the most commonly cited figure in climate change debates—change in the average global temperature—has no correlate in anyone's actual living conditions (Edwards cited in Mehnert, *Climate Change Fictions* 54)

Scientific models show the complexity of climate change. They are a tool to identify and quantify Earth system processes. Using equations to describe and analyze the relationship between energy and matter, they follow a mathematical logic, whereas stories are rooted in creativity and can develop their own logic. Scientific models limit the story's space for creativity because models are defined by specific parameters, whereas stories can circulate and develop their own narrative patterns more freely.

Footnotes with references to scientific articles in climatology supplement the annotations and enforce the authority of academic knowledge. This emphasis on science as objective discourse is a common feature of cli-fi texts that employ a scientific mode[28] and grounds the texts in facts to challenge climate change skepticism. The fictional portion of the novel relies heavily on the non-fictional explanations provided in the paratext. However, the footnotes interrupt the narrative flow, which strips away the affective quality of literary writing because it does not allow readers to completely immerse themselves in the story world. Although the novel counters the kind of realistic depiction of science found in *The Swarm*, the fictional story of Alice is still anchored in the fact-based world of climatology.

At the same time, the novel experiments with other literary genres in terms of how they visualize and convey a sense of urgency regarding the climate crisis. At the "Impact Theater," Alice attends multiple plays that dramatize the negative repercussions of climate change. These plays also emphasize the creative engagement with science as they narrate the concept of tipping points. The code word to enter the theater is "450 parts per million,"[29] and each play imagines a scenario above this threshold. Entitled "Man leaving the Holocene"/"Der Mensch verlässt das Holozän," the last play portrays a world six degrees warmer. The title references the novel *Man in the Holocene*/*Der Mensch erscheint im Holozän* by Max Frisch (1979) and highlights anthropogenic climate change in the Anthropocene. Moreover, the play is inspired by Nigel Jamieson's play *As the World Tipped* (2011), a work that asks how climate change can be visualized through art. While climate change is presented as a scientific phenomenon up until this point in the novel, this play addresses it as a human rights and social justice issue. Set in a swimming pool,

[28] Michael Crichton's climate sceptic novel *State of Fear* (2005) is an example of using footnotes to direct the reader's attention to scientific facts outside the fictional text, yet it is much more suspense driven than Boysen's novel.
[29] This refers to the threshold of atmospheric levels of carbon dioxide reaching a point where global temperatures would increase by an average of two degrees above pre-industrial levels.

the play features scenes that recall real-life images of migrants risking their lives to cross the Mediterranean Sea to Europe. Groups of adults and children on pontoon boats fight over containers of drinking water. The ending of the play illustrates particularly well how performing a scene of violence and destruction can convey a sense of urgency that differs from presenting climate change as a purely scientific issue:

> Knife blades flashed, shots were fired, and blood mingled with the spat-out water, on which small carpets of plastic and wooden garbage were floating, and now also corpses. [...] Alice would have had to dive to leave the hall, but the few doors were narrow, and she wasn't the only one wanting to get out. So, she sat on the very top step of the grandstand and fed the sparrows the leftover peanut crumbs from her bag until the piece was over and the water was drained from the basin. The eaten skeletons of formerly colorful reefs came to light, on which the thin topsoil lay like ugly mud. Those still sitting in the stands heard a soft, human voice: "In the beginning was human dignity. That dignity was inviolable. When it was touched, the human being was declared touchable. In the end was the knife. His blade was untouchable. After being touched, it remained untouchable. Because a piece of the hand was missing..." (112-13)[30]

As an immersive experience, the play sets out to trigger a response from the audience and to break through feelings of indifference. In addition to the violent struggle for survival in a hostile environment, the audience is presented with scenes of destruction and extinction. The images of plastic waste mixed with corpses floating in the water and the remains of dead reefs are paired with lines inspired by the following passage from the German constitution: "Human dignity shall be inviolable"/"Die Würde des Menschen ist unantastbar" (Deutscher Bundestag). Here, Boysen

[30] "Messerklingen blitzen auf, Schüsse fielen und Blut mischte sich in das vollgespiene Wasser, auf dem kleine Müllteppiche aus Plastik und Holz trieben und nun auch Leichen. […] Alice hätte tauchen müssen, um die Halle zu verlassen, doch die wenigen Türen waren eng, und sie war nicht die Einzige, die hinauswollte. Also setzte sie sich auf die alleroberste Tribünenstufe und fütterte die Spatzen mit den übriggebliebenen Erdnusskrümmen aus ihrer Tasche, bis das Stück zu Ende war und das Wasser aus dem Becken gelassen wurde. Zum Vorschein kamen die zerfressenen Skelette ehemals farbenfroher Riffe, auf die sich die dünne Ackerkrume als hässlicher Schlamm legte. Wer noch auf der Tribüne saß, hörte eine leise, menschliche Stimme: Am Anfang war die Würde des Menschen . Diese Würde war unantastbar. Als sie angetastet wurde, wurde der Mensch für antastbar erklärt. Am Ende war das Messer. Seine Klinge war unantastbar. Nachdem sie angetastet wurde, war sie weiterhin unantastbar. Denn es fehlte ein Stück von der Hand." (112-113)

uses a non-fictional intertext to link the fictionalization of climate science to the reality of climate change as a complex socio-political issue. The play points back to literary writing as a way of bridging the gap between abstract concepts and the lived experiences of those suffering from the concrete impact of climate change. However, the novel's scientific mode does not reflect on the socio-political reality that the play addresses and continues to treat the role of the sciences as a separate, isolated, and 'objective' discourse.

Throughout the novel, Alice finds herself listening to other creatures, such as the trees in the rainforest, explaining how anthropogenic climate change has affected their lives. Yet, Alice wanders around in a virtual reality as a disembodied mind, an observer in a space with a body. In the theatre scene, readers are presented with Alice as a witness to the violent scenes unfolding on stage. She mediates this dramatization of climate change, which creates a distance between her and the reader and limits the play's catharsis effect. Moreover, the descriptive voice of the third-person narrator and Alice's indifference to the scenes remove the reader from the play's affective quality and the power of its stark imagery. Although Boysen points out that Alice illustrates empathy as a powerful tool (Boysen interview) in the face of climate change skepticism, the author's desire to convince the reader by means of theoretical facts does not leave room to cultivate this empathy. Instead, literature is used in the service of science to educate the public about climate change. I suggest the term "climatology fiction" to describe *Alice* because it takes the scientific study of climate as its point of departure and veers away from the key characteristics of the novel (i.e., narrative sequence). The scientific method of climate modelling dominates the text, and language functions as a way of translating mathematics into a narrative. This translation lacks a deeper engagement with poetic language and storytelling. The text becomes a vehicle to

communicate science using figurative language while also mimicking non-fiction academic writing and argumentation.

Experimenting with literary devices to convey scientific information, Boysen seeks to bridge the gap between fiction and pure scientific explanation, scientific journalism, and fictionalized science. The novel presents climate modelling as part of an objective scientific process but uses the literary text as a tool to communicate knowledge about the specificities and purpose of such modelling. This attempt to pair scientific logic with literary storytelling and world-building causes tension in the text. For example, the references to personified mathematical formulas and scientific concepts require specific pre-existing knowledge. Readers can find this additional knowledge in the foot- and endnotes, which interrupts the narrative flow of the novel. Jumping back and forth between the story world and the non-fictional element of the paratext confuses the reader. Another issue is the presentation of science as isolated and rather uncritical. In the end, it is science that once again provides the solutions to climate change. In this way, the novel is squarely situated in the scientific mode, maybe even more so than Schätzing's novel, given the use of paratext and pre-existing scientific knowledge. Yet, by using elements from Lewis Caroll's novel to create a non-scientific literary framework, the text tries to animate science, making it more than just a set of equations, concepts, and theories. If this experiment fails to inspire the reader, it is in part because the emotional, socio-political, and even cultural components of the climate crisis are lost. These components are the focus of the third example discussed in this chapter, a cli-fi novel that evokes climate change emotions without referencing climate models, climate science or really any other scientific knowledge.

IV. Writing to cope: developing a poetic cli-fi mode in *Milk Teeth*

In Bukowski's novel *Milk Teeth*,[31] a young woman, Skalde, writes a first-person report about her life with her mother Edith in a region that is cut off from the so-called "dead territories" where life has become unbearable for humans. When Skalde takes in Meisis, a young girl she finds in the woods, she faces the anger of the locals in the territory who are extremely hostile towards outsiders. When they threaten to kill Meisis, Skalde is able to negotiate an ultimatum: if Meisis starts losing her baby teeth, a trait that would differentiate her from outsiders like Edith who never lost their milk teeth, she will be allowed to stay. As the hostility towards her and Meisis starts to intensify and Edith is killed by one of the locals for picking ripe fruit from a Mirabelle tree, Skalde, together with Meisis and her sister Metta, leave the territory. The novel begins with Skalde starting to write after having crossed the river to leave the territory, which is the novel's last scene. Instead of narrating climate change through the scientific mode, the novel presents it as a slow unfolding of different kinds of effects on landscapes, humans, and animals.

Skalde's account from childhood to her present blends elements of diary writing with the apocalyptic and the post-apocalyptic. Through an intimate first-person narrative, the novel zooms in on the everyday within a climate-changed world. Without mentioning words like "climate change" or "environmental crisis," the novel explores the themes of survival, dystopian social dynamics, eco-anxiety, climate change depression, and inter-generational memory. The novel makes room for the complex and slowly unfolding ripple effects climate change has on individuals, collectives, and ecosystems. It is a hybrid text that combines aspects from various genres (e.g., survivalist report, diary writing, coming-of-age story) and replaces the scientific with a perspective that is attuned to the emotional aspects of living, reading, and writing in such a modified world.

[31] All English quotes are from Helene Calleja's translation. The German original can be found in the footnotes.

In contrast to Boysen's novel, which focuses on climate modelling and mathematical equations and in which the main character is a disembodied mind in a virtual reality, Bukowski leans into the power of literary writing to create an aesthetics that allows readers to immerse themselves in the story world. The novel reveals the role of literary atmospheres in cli-fi by focusing on the emotional and social effects and ongoing trauma in a climate-changed world. It marks an important shift with respect to cli-fi as a genre because of its emphasis on eco-trauma, the effects of changing temperatures on individual human and non-human bodies, shifting social dynamics, and writing as a form of survival. My analysis will demonstrate how the novel uses different kinds of writing as part of its poetic mode. In addition, I will outline the concept of *Stimmung* or literary atmosphere to show how the novel offers an alternative model for imagining climate change without science.

The following quote by Joan Didion that precedes Skalde's report frames the novel as a story about landscapes and humans shaping one another: "Don't you think people are formed by the landscape they grow up in?" This paratextual element draws attention to the influence of childhood places on later human development. At the beginning of the report, Skalde describes a hostile environment and does not explain the reasons for the environmental changes that alter the living conditions for humans and non-humans (e.g., animals losing their colour). Because the text never explicitly mentions climate change, readers need to fill in these gaps that point to the broader imaginary of climate change outside the text. Descriptions of the place in which Skalde lives (e.g., the territory, an unnamed place by the sea outside the territory, or the forest) convey a sense of slowly unfolding changes that accumulate into a stretched-out apocalypse. Whereas narratives like *The Swarm* frame climate change as the occurrence of catastrophic events that are explained through a scientific lens, *Milk Teeth* focuses on the emotional and social effects and ongoing trauma

that are taking place in a world where 'the apocalypse' is replaced with the continuous struggle to survive. Rather than taking on event character, natural disaster is portrayed in the form of gradually changing weather patterns that are part of the characters' everyday life.

Even if the effects of climate change happen over days and days, they are still extremely disruptive. As LeMenager explains, "climate change represents, among other things, an assault on the everyday" (222). *Milk Teeth* explores the consequences of this violence both on individuals and the collective. In addition to highlighting the importance of writing, recording, and adapting to climate-changed environments, Bukowski creates a specific *Stimmung* or literary atmosphere by way of an aesthetics of the "assault on the everyday." Creating such a literary atmosphere, the novel fills in the gaps of science-based storytelling and translates "absence into imaginary presence" (Zapf 93).

The German term *Stimmung* has a "long conceptual history in the German-speaking aesthetic-philosophical tradition" (Breidenbach 2). It has multiple meanings and uses in philosophy as mood, in music as attunement, and in aesthetics as atmosphere. This contributes to its "untranslatability" (Spitzer cited in Wellbery 1). *Stimmung* has no equivalent in major European languages and brings together moods and atmospheres in a unique way. It is articulated emotionally and spatially and transcends the boundary between subject and object, between individual and collective. In colloquial language, *Stimmung* is often used metaphorically to refer to atmosphere in a social context (e.g., political atmosphere), a person's mood, or feelings triggered by objects and environments, such as artworks or landscapes. Therefore, both subject and object participate in a reciprocal attunement process that evokes a particular kind of *Stimmung*.

Gernot Böhme approaches the concept of atmosphere in phenomenological terms. He develops an aesthetic theory according to which architectural work, landscape design, music, and

language can offer atmospheric modes of experience (114-16). According to Böhme, atmospheres can be encountered and produced in different aesthetic productions, including literary language (115). Natalie Dederichs argues that literary atmospheres are essential in unveiling the invisibilities of the ecological crisis (15). The term atmosphere comes from the combination of the Greek words *atmos* meaning vapor and *sphaira* meaning ball or globe. In Earth sciences, it refers to the gases that surround the planet. The fleeting and ephemeral nature inherent in this definition makes atmosphere an interesting concept for exploring how literature captures the abstract concept of climate change. Similar to the aura of a work of art, as described by Walter Benjamin (221), literary atmospheres create textual environments that evoke emotions or a mood. They form spaces to imagine what it means to live in a climate-changed world in terms of affect and emotion as expressed through the meaning of language.

It matters that a text uses atmosphere instead of climate science to connect with readers' emotions and imagination because science alone cannot fully address the ethical and emotional issues of climate change. According to Kate Rigby, literature provides opportunities to reflect on the mediating function of language:

> While providing training in those extratextual experiences of atmosphere that it cannot fully mediate, literature serves also to remind us of the role of words, and the complex and mobile networks of intertextual connotation they activate, in inflecting those states of feelings engendered by our physical encounters with other people, things, and places. (150)

Skalde's description of the harsh living conditions of the environment in which she is writing (that is part of the novel's preface) evokes climate change imagery that is centred on perception:

> The fog has swallowed up the sea. It stands like a wall, there, where the beach begins. I can't get used to the sight of water. I'm always looking for a bank on the opposite side that could reassure me, but there's nothing but sea and sky. These days, even this line is blurred. We hardly ever see the sun, but that will change. There's a sign already: the animals are losing their colour here now too. Some of them try to escape across the sea, but the waves

> wash them back up on the beach after a few hours. We find them among pieces of driftwood and plastic. No one knows if we could get sick from them, but our hunger is greater than our fear.
> We can't turn back. Some say there was a fire. The dryness of the forests. A single spark. Unfavourable wind. I imagine a black plain. Ash falling like snow. The horizon unobstructed.
> Others claimed the process had been creeping. Bit by bit, everything crumbled to dust.
> All we can do is forge ahead.
> I can't sleep at night. This is why I've decided to begin my account. Writing should fill the dark hours. (11)[32]

Skalde situates the act of writing as part of her struggle to survive in an environment where animals lose their colors, the beach is full of plastic waste, the forests are dry, and food is scarce. The imagery of an all-consuming fog that 'swallows' and blurs the lines between land, water, and sky evokes a sense of disorientation. Because the text immediately immerses readers in this strange and unfamiliar environment without providing much context, they need to orient themselves in an environment where familiar textual markers (i.e., naming the geographical location or identifying the narrator) and perceptual clues (i.e., the horizon) no longer serve as orientation points. Skalde's writing provides readers with new 'signs,' such as colourless dead animal bodies, which contributes to an eerie atmosphere of decay. Creating new links between words like 'hunger' and 'fear' or 'ash' and 'snow' combined with the imagery of fire intensifies the strangeness of this environment and gives rise to an oppressive atmosphere. This sets the tone for the ways in which

[32] "Der Nebel hat das Meer verschluckt. Wie eine Wand steht er dort, wo der Strand beginnt. An den Anblick des Wassers kann ich mich nicht gewöhnen. Immer suche ich nach einem gegenüberliegenden Ufer, das mir Halt geben könnte, aber bis auf Meer und Himmel ist da nichts. An diesigen Tagen verschwimmt selbst diese Grenze.
Die Sonne bekommen wir kaum zu Gesicht, doch das wird sich ändern. Einen ersten Vorboten gibt es bereits, die Tiere verlieren nun auch hier ihre Farbe. Einige von ihnen versuchen die Flucht über das Meer, aber die Wellen spülen sie schon nach wenigen Stunden zurück an den Strand. Wir finden sie zwischen Treibholzstücken und Plastikmüll. Niemand weiß, ob wir von ihnen krank werden, aber unser Hunger ist größer als unsere Furcht.
Umkehren können wir nicht. Einige sagen, es hat ein Feuer gegeben. Die Trockenheit der Walder. Ein einzelner Funke. Ungünstiger Wind. Ich stelle mir eine schwarze Ebene vor. Die Asche fällt wie Schnee. Der Horizont unverstellt.
Andere behaupten, der Prozess sei schleichend gewesen. Nach und nach sei alles zu Staub zerfallen.
Uns bleibt nur die Flucht nach vorn.
Nachts finde ich keinen Schlaf. Ich habe mich deshalb entschlossen, mit meinem Bericht zu beginnen. Die Beschäftigung soll mir die dunklen Stunden füllen." (7-8)

the novel continues to evoke climate change without naming it by creatively using language to appeal to readers' emotions. Although Skalde's speculation about forest fires portrays climate change as a series of catastrophic events, like wildfires or floods, the passage brings to mind climate change as a subtle "creeping" process that stretches over longer periods of time.[33]

Skalde uses her imagination to make sense of this process and the unknown and unstable conditions of her surroundings. To her, writing not only serves as a way of "filling the dark hours," but also as a form of reflection on the past that brings her comfort and helps her move forward. Following the preface, she recounts in 77 short chapters the events that led her to leave the region she grew up in. Interspersed with notes, which are capitalized to set them apart from her cohesive and chronological account, the novel blends Skalde's descriptions of everyday life with lines of poetic and more spontaneous writing. As Skalde sifts through and rearranges the short notes she started writing as a child and once hid around her mother's house, she recounts her story. She integrates these "pieces of paper" that contain "the years compressed into words and letters of the alphabet" (218)[34] into her report, which gives readers insight into her writing process as a way of living within, adjusting to, and coping with unstable and hostile environmental and social conditions. The notes illustrate particularly well how Skalde uses different kinds of writing to find a language to express how it feels to live in a world altered by climate change:

> SEAGULLS HAVE BEEN TUMBLING FROM THE SKY FOR YEARS, LOSING THEIR GRIP ON THE HORIZON, FALLING FEATHERS. (166)[35]
>
> I DREAMED OF THE RIVER, WATER WAS ALL AROUND ME. I WAS FREEZING, WITHOUT BEING ABLE TO SAY WHERE I WAS. I DIDN'T SEE THE RIVERBANK

[33] Moreover, the novel zooms in on the uncomfortable battle between individuals and families fighting for resources (for example, Edith gets shots because she is picking fruit from a tree on someone else's property). Thus, the text also imagines the horror of other people in addition to the eerily dry and devastated landscape.
[34] "Ich sammelte meine Zettel ein. […] Die Jahre zu Wörtern und Buchstaben komprimiert." (280)
[35] "SEIT JAHREN FALLEN DIE MÖWEN AUS DEM HIMMEL,
VERLORENER HALT AM HORIZONT, GESTÜRZTES GEFIEDER." (164)

> ANYWHERE. AND THEN A SHOT. IT CUT THROUGH THE DEPTHS, CUT THROUGH THE DREAM. I WOKE WITH A START. (191)[36]

The use of short fragments of text in these two examples intensifies the sense of disorientation and the atmosphere of oppression and decay that runs through the novel. It also reveals the ways in which writing becomes a repository for memories of environment.

At several moments in the novel, Skalde reflects on the reading and writing process as she searches to make sense of her past and present lives. The readers bear witness to these processes, which creates a sense of intimacy:

> My notes are laid out before me on the rough tabletop. I haven't looked at them once since we left the territory. I didn't want to have to remember. But now, I can no longer block out the images. I start reading, and everything resurfaces. So clearly, as if I were watching a film. With the help of the notes, I want to put everything that happened in the right order. I will tell it as I experienced it, because it should be my story. (15)[37]

Writing becomes a way of documenting the struggle to survive in a climate-changed world with extreme weather conditions, climate migration, scarcity of resources, and social conflicts. Readers are invited to imagine their own lives in such a reality, without feeling overwhelmed by a sense of apocalypse or impending doom. Skalde has 'lived through' the events and continues to 'live with' them.

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[36] "ICH TRÄUME VOM FLUSS. UM MICH HERUM WAR WASSER. ICH FROR. OHNE SAGEN ZU KÖNNEN, WO ICH MICH BEFAND. NIREGNDS SAH ICH DAS UFER. UND DANN EIN SCHUSS. ER ZERSCHNITT DIE TIEFEN. ZERSCHNITT DEN TRAUM. ICH SCHRECKTE HOCH." (246)

[37] "Vor mir auf der groben Tischplatte liegen meine Notizen. Seit wir aus der Gegend geflohen sind, habe ich sie mir kein einziges Mal angesehen. Ichwollte mich nicht erinnern müssen. Jetzt gelingt es mir nicht mehr, die Bilder zu verdrängen. Ich beginne zu lesen, und alles taucht wieder auf. So klar und deutlich, als würde ich einen Film betrachten. Mithilfe der Notizen will ich das, was passiert ist, in die richtige Reihenfolge bringen. Ich werde erzählen, wie ich es erlebt habe, denn es soll meine Geschichte sein." (7-8)

Leaving the house and spending time in the forest alone for the first time is a key moment in Skalde's life that coincides with rapidly changing weather patterns and prompts her to write down observations, thoughts, and feelings:

> The next morning, a dazzling brightness filled my room. I thought it was a dream, but the light endured. I looked out the window and was shocked by what I saw. The sky over the landscape was blue. It was the first time everything wasn't overcast with fog. I had to close my eyes; it glowed red behind my eyelids. Squinting, I got dressed and went into the garden. […] Around midday, the fog drew in once more. And in the night, it was so cold that the top layer of water on the rain barrel froze. […] Not long after, the weather began to radically change, and for a long time I believed that I was to blame. I hadn't kept to Edith's rule of not leaving the plot and had disturbed the order of things. To overcome my feelings of guilt, I started writing these things down. Out from single words came whole sentences. Through these I tried to hold on to what was about to disintegrate: the world as we knew it. (23)[38]

Skalde's writing is attentive to the ways in which the environments around her change. Without using the expression 'climate change,' the novel illustrates a way of experiencing it through emotions (i.e., guilt), subjective explanation (i.e., 'disturbed order') and close observation of the weather (i.e., changes from sun to fog to sun). Skalde is overwhelmed by the sight of the sunshine, closing her eyes, seeing red, again reminding readers that sight, too, is conditioned by what has been seen before. Throughout her writing, Skalde includes observations of changing environmental conditions that present the 'signs' of climate change's rupturing force through colours, smells, and sounds within a bizarre atmosphere of decay:

[38] "Am nächsten Morgen füllte eine gleißende Helligkeit mein Zimmer. Ich glaubte an einen Traum, doch das Licht blieb. Durch das Fenster blickte ich hinaus und erschrak. Blau war der Himmel über der Landschaft. Keine Wolke war zu sehen, nur die Sonne stand über dem Haus. Es war das erste Mal, dass nicht alles von Nebel verhangen war. Ich must die Augen schließen, rot glühte es hinter meinen Lidern. Blinzelnd zog ich mich an und ging in den Garten. […] Gegen Mittag zog der Nebel wieder auf. Und in der Nacht wurde es so kalt, dass die oberste Wasserschicht in der Regentonne gefror. […] Nicht lange danach began sich das Wetter radikal zu verändern, und ich glaubte lange, es sei meine Schuld. Ich hatte mich nicht an Ediths Regel, das Grundstück nicht zu verlassen, gehalten und die Ordnung durcheinandergebracht. Um gegen meine Schuldgefühle anzukommen, begann ich, die Dinge aufzuschreiben. Aus den einzelnen Wörtern wurden ganze Sätze. Durch sie versuchte ich, festzuhalten, was im Begriff war, sich aufzulösen, die Welt, die ich kannte." (31-32)

> During our wanderings it occurred to me that everything would become even drier. The meadows and the fallow fields reminded me of the descriptions of the steppes that Edith read to me once a long time ago. The yellowish-brown grass, the almost leafless bushes and trees. Their branches cut into the blue sky with their sharp edges. Then once more whole processions of hedge rows in bloom. We could already smell them from far off. This idyll had something brutal about it. The scent pressed itself against my forehead and made me giddy. The landscape seemed quieter to me too. The air was motionless. The vibrating chirps of the insects seemed to be sunken in the meadows. (131)[39]

Her description of the 'almost leafless bushes and trees' that 'cut into the sky' evokes a harsh and violent atmosphere that contrasts the scent of the blooming hedges. The sounds and smells of this place create an atmosphere shaped by contrasts, such as the 'motionless' air or 'the vibrating chirps of the insects.'

As part of its poetic mode, the novel reflects on writing as a way of making sense of a ruptured world. Skalde's intimate descriptions of and feelings about her world make room for mourning that which has been lost due to climate change. For example, her mother, Edith, is in a state of melancholy and rarely leaves the house. Several scenes in the novel illustrate how her melancholy is intimately linked to the loss of past species and landscapes.

> Edith had covered the inside walls with pictures of the sea:
> SANDY BEACH
> BRIGHT DUNES
> WASHED UP SEAWEED
> MOSSY BREAKWATERS
> A PIER IN THE FOG
> A BOMBED-OUT BOARDWALK
> She only went in the room in order to sit inside the wardrobe and look at the pictures with the flashlight. If she heard me walking past, she would call out: "I only recognize the pine forest. It looks like the pine forest near the coast." (28)[40]

[39] "Während unserer Streifzüge fiel mir auf, dass alles noch trockener geworden war. Die Wiesen und brachliegenden Felder erinnerten mich an die Beschreibungen von Steppen, die Edith mir früher einmal vorgelesen hatte. Das gelbbraune Gras, die fast blattlosen Büsche und Baume. Scharfkantig schnitten ihre Äste in den blauen Himmel. Dann wieder ganze Heckenzüge, die blühten. Schon von Weitem rochen wir sie. Die Idylle hatte etwas Brutales. Der Geruch drückte sich gegen meine Stirn und ließ mich schwindeln. Auch kam mir die Landschaft stiller vor. Die Luft stand unbewegt. Das vibrierende Zirpen der Insekten schien in die Wiesen gesickert zu sein." (129)

[40] "Die Innenwände hatte Edith mit Bildern vom Meer tapeziert:

Edith longs for a place that is no longer inhabitable, a place from which she had to flee. Her sudden arrival in the territory is met with hostility, but when she is told that there is no space for her, she explains that there is no place she can go back to ("How can I go back when the place I came from no longer exists?" 81).[41] Although the novel does not provide details about these catastrophic events, Edith's mourning of the loss of marine landscapes suggests environmental collapse.

Snippets of memories of environmental conditions from "the before" appear throughout the novel and moments of remembrance trigger melancholic feelings. Similar to Skalde, who articulates her feelings through writing, Edith holds on to poetry as a way of coping with living through ecological extinction. For example, as she buries dead seagulls that lie "twisted in the grass, their feathers scorched […] with enflamed patches on their bellies" (19),[42] she recites poetry. Witnessing how the changing weather patterns affect not only humans but also other species, is a traumatic experience for Edith that puts her in a state of apathy. In the same passage that describes Edith's way of mourning the dead seagulls, Skalde puts her own coping mechanism into question when she asks "who here still cares about poetry?" (19),[43] which illustrates how she reflects on the limitations of her own text to express emotions of despair in the face of climate change. Skalde's attempt to capture that which falls apart is constantly challenged by her surroundings. Yet, she finds

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SANDSTRAND
HELLE DÜNEN
ANGSPÜLTE ALGEN
BEMOSSTE WELLENBRECHER
EIN PIER IM NEBEL
EINE AUSGEBOMBTE STRANDPROMENADE
Sie betrat das Zimmer nur noch, um sich in den Schrank zu setzen und die Bilder im Licht der Taschenlampe zu betrachten. Wenn sie mich vorbeigehen hörte, rief sie: »Nur der Kiefernwald ist mir hier vertraut. Er sieht aus wie der Kiefernwald nahe der Küste.«" (39)

[41] "Wie soll ich zurückgehen, wenn der Ort nicht mehr existiert, der mein Ausgangspunkt war?" (107)

[42] "Wir fanden sie verrenkt im Gras. Die Gefieder wie angekohlt, oft mit entzündeten Stellen am Bauch oder an den Gelenken der Flügel." (14)

[43] "…wer macht sich hier noch etwas aus Gedichten?" (14)

comfort in writing and turns to literary language as a way of reflecting on her observations of changing environmental conditions. To her, writing is an attempt to "hold on to what was about to disintegrate: the world as I knew it" (23).[44] She uses her imagination to remain hopeful:

> In spite of everything I still assumed that it was only a matter of time until this endless summer came to an end. I often imagined how I would lead Meisis through the misty landscape. I pictured us walking in two identical raincoats through the wet meadows, the blue sky hidden behind thick clouds. The light dulled; the bushes and trees a lush dark green. Water dripping from their branches.
> I still see it in my dreams. (131)[45]

These images of lush landscapes in Skalde's dreams point to what is lost. Writing and imagination function as ways of remembering, but also speculating about the future.

Although Skalde's writing is anchored in place, the geographical setting of the novel remains unclear. Not naming a region or city detaches the apocalyptic and post-apocalyptic mood of the novel from a specific location. The novel depicts climate change, then, as a delocalized global phenomenon. This phenomenon is presented through the lens of an individual who finds herself in a hostile environment that challenges feelings of being-at-home (feelings of *Heimat*). However, Skalde's intimate perspective bridges the gap between a broader sense of planet and the embodied experience of living in a specific climate-changed environment. As Skalde transitions from childhood into adolescence and adulthood, she develops a sense of place that is anchored in the forest. She writes about her immediate experience of being physically present in the forest for the first time and how this environment instills a sense of belonging:

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[44] "…festzuhalten, was im Begriff war, sich aufzulösen, die Welt, die ich kannte." (32)

[45] "Trotz allem ging ich noch immer davon aus, dass es nur eine Frage der Zeit wäre, bis dieser endlose Sommer ein Ende finden würde. Oft stellte ich mir vor, wie ich Meisis eines Tages durch das nebelverhangene Land führte. Ich sah uns in zwei identischen Regenjacken über nasse Wiesen laufen, der blaue Himmel hinter dicken Wolken verborgen. Das Licht stumpf, Büsche und Bäume im satten Dunkelgrün. Von ihren Zweigen tropfte es.
Noch heute finde ich dieses Bild in meinen Träumen." (129)

> The forest stood there as if it had been waiting for me all these years. I studied the bark of the pines, shunted the needles on the ground with my feet, put two pine cones in the pocket of my raincoat, and lay, until it got dark, in a hollow between the roots, gazing up into the branches above me. I understood that I belonged here too and that the landscape beyond the house, beyond the garden, was also made for me. (25)[46]

This passages reveals another layer of the novel's poetic mode because it foregrounds how humans form affective relationships with environments from a non-scientific perspective. Even though Skalde is living in a world that has been devasted by climate change, she is still able to develop a relationship with the natural world, to the forest as a place of comfort, stability and belonging. After her discovery of this environment, she "rarely stayed in the house" and "familiarized" herself with the landscape. In the original German version, this passage uses the verb *sich anvertrauen*, which means *to confide in* or *to entrust oneself in*. The choice of *to familiarize* in the English translation (by Jen Calleja) does not capture the intimate bond between Skalde and the forest. She overcomes feelings of isolation and loneliness by spending time in the forest, and in her writing, she reflects on the feeling of being physically present in the landscape. This kind of reflection further contributes to the text's poetic mode because it highlights what it means and how it feels to have a body in a world shaped by climate change. "Sometimes," Skalde writes, "we would lie for hours between the pines and not move. It almost felt like we would sink into the landscape."[47] Through these images, Skalde describes what it feels like to live in the climate-changed world of the territory, which is central to the ways in which the novel adopts a poetic mode that emphasizes the affective and emotional aspects of the environmental decline that Skalde experiences.

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[46] "Der Wald stand, als hätte er all die Jahre auf mich gewartet. Ich untersuchte die Rinde der Kiefern, verschob die Nadeln auf dem Boden, steckte zwei Tannenzapfen in die Tasche meines Regenmantels und lag, bis es dunkel wurde, in einer Kuhle zwischen den Wurzeln, den Blick in den Zweigen über mir. Ich verstand, dass ich auch hier hingehörte und dass die Landschaft jenseits des Hauses, des Gartens, auch für mich gemacht war." (17)

[47] This refers back to the idea of human and landscape shaping each other expressed in the quote by Joan Didion.

V. Conclusion: Modes of cli-fi as evolving

Whereas Schätzing and Boysen use their narratives as a way of translating scientific knowledge about climate change into simple and accessible language with a pedagogical goal, *Milk Teeth* invites readers to feel what it's like to live in a climate-changed world. The novel zooms in on the main character's individual experience of changing environmental conditions and how these conditions physically and mentally affect humans and shape social dynamics. In this way, the novels illustrate the concept of modes – one scientific, the other poetic – that I have adopted to challenge the idea of climate fiction as a single genre with a set of fixed characteristics, narrative tropes or style of writing.

To conclude, it is important to note that both the scientific and the poetic modes have their strengths and weaknesses. In *The Swarm*, Schätzing keeps readers entertained and interested in plot by narrativizing scientific information as part of the text's dramatic arc. Even the ways in which the novel unveils the problematic relationships between science, industry, and politics add to its entertainment value, which limits the scientific mode to a form of 'infotainment' that lacks a metatextual critique of the scientific discourses it presents. This lack of critique as a weakness of the scientific mode is particularly visible in *Alice.* The novel communicates science without reflecting on how this discourse shapes the perception and construction of climate change in the text. Although the novel's scientific mode is not plot-driven, as is the case in *The Swarm*, and Boysen experiments with personification and uses intertextual references, making readers aware that texts build on each other, it functions as a tool to *teach* and glosses over the potential of storytelling to appeal to readers' emotions. *Alice* thus dilutes the strength of metaphor and figurative language because of its heavy reliance on paratextual scientific information to communicate climatological research. A desire to convince readers by means of characters that

function as stand-ins for theoretical facts drives the novel and limits its ability to cultivate empathy. In *Milk Teeth*, the text itself reflects on and acknowledges the limitations of writing and using first-person narrative and poetic language to bring readers closer to the affective aspects of climate change. Bukowski conveys the emotions of the climate crisis by adopting a poetic mode that centres on Skalde's subjective experiences of radically transformed environments. Articulating climate change as a tone or atmospheric quality and emphasizing how writing can bring about a sense of comfort further characterize this mode. Ultimately, the poetic mode indirectly leads the reader to critique the ways in which scientific perspectives dominate how climate change is imagined. A weakness of the poetic mode lies in its ambiguity since readers are never explicitly told what caused the environmental collapse; it may have been a nuclear explosion or a world war or a meteorite hitting the earth. Yet the novel provides enough clues for the reader to experience a climate change 'atmosphere' and so construct their own imaginary around living through or after disasters.

I am not, however, suggesting that one mode is more effective than the other or that they are to be viewed as always used separately. Rather, I suggest that these modes highlight the ways in which cli-fi evolves and they point to the emergence of other possible combinations or kinds of modes that make up this literary genre. In this way, I hope to have provided a nuanced understanding of cli-fi as a literary genre and answered some of the questions about the narrative challenge of science in cli-fi. As I will show in the next chapter, another issue that requires careful attention when literature imagines climate change is how texts narrate, facilitate and mediate relations to the non-human.

CHAPTER TWO

QUESTIONS OF STORY:

REPRESENTING NON-HUMAN AGENCY AND RELATIONS

How can climate change be narrated as a story that challenges the ontological divide between human and non-human and contributes to new ecological ways of imagining the future of the Earth? First, I would argue that the worldviews, conceptions, and ideologies presented in cli-fi texts allow readers to better understand the different cultural and socio-historical roles that humans play within the planetary ecosystem and that underpin contemporary thinking about the climate crisis. In addition, cli-fi represents non-human lives and stories in the vast scale of climate change while also situating the human within the planetary ecosystem. Although cli-fi is an excellent ground for combining the material and the textual and articulating what it means to live within what Morton describes as "the mesh" (*The Mesh* 22), it still uses words, language and narrative to imagine climate change, a phenomenon that does not have a single specific material form. Narratives give shape to this abstractness, and cli-fi texts feature the manifestations of climate change, such as the effects of changing and extreme weather patterns, or the loss of wildlife. Filtered through human thinking about the world in some way (i.e., the use of tropes or anthropomorphic language), these forms are momentarily organized in the text. The aim of this chapter is to reconsider the non-human in relation to climate change as mediated through stories and to discuss more generally how language engages with the living world.

First, I will address the issue of representing non-human agencies, revisiting the role of anthropomorphism as articulated by Bruno Latour and then delving into storying matter as theorized by new materialism. I then use these conceptual tools to examine how the three cli-fi

novels considered in this chapter give form to the living world. Grappling with the issue of representability, they employ specific formal and narrative strategies to imagine the non-human less anthropocentrically. In *The Swarm*, I will focus on the representation of the yrr, an imaginary organism, to address the textual representation of the non-human. Although there are many other animals and plants in the novel, the yrr pose a particularly interesting problem because they do not exist in 'real life' (as far as we know). Framed by scientific discourse, the yrr display new kinds of intelligence and live in parts of the ocean unknown to humans. As a species, they push human-centred thinking to its limits and force humanity to resituate itself as one actor among many within the planetary ecosystem. They thus disrupt common understandings of matter and agency, individual and collective intentionality and temporality. In this way, the novel attends to alternative modes of expression and other-than-human ways of experiencing the world. Ilija Trojanow's novel *Eistau/The Lamentations of Zeno* (2011) engages with a much more familiar climate change subject: melting glaciers. The relationship between Zeno, a glaciologist, and his object of study, glaciers, raises questions about representing and imagining the non-human. Articulated through the lens of love and care, Zeno's relationship to the glaciers anthropomorphizes them. He wants to educate the world about the disappearance of glaciers as a way of speaking for them. However, he also subjects them to a male gaze and paternalizes them, which locks them into a highly anthropocentric perspective. However, this anthropocentrism is complicated on the level of form when Zeno's story is interrupted by short collections of fragmented, collective text. My last close reading in this chapter moves from analysing the representation of glaciers to examining the narration of water in a postmodern text. In *Malé* (2020), Roman Ehrlich defamiliarizes the Maldives, a place that is often associated with climate change, to engage readers in thinking about climate as an agent. Ehrlich uses a postmodern lens to re-imagine the Maldives as an absurd space

where tourists' ideals of a tropical paradise are reversed; water becomes an agent of climate change that escapes the world of the text. My analysis of these three novels will reveal the extent to which they diverge from, comply, or experiment with traditional and human-centred modes of storytelling (e.g., a clear narrative arc with human drama at the centre) to articulate climate change as a force independent of human conceptions of agency.

I. Narrating Non-human Agencies

In an era of catastrophic events caused by anthropogenic climate change, such as floods or wildfires, our thinking about the natural world needs to shift from one of passive object to one of active subject. Capturing this shift in story requires us to apply the term "agency" beyond the human realm. Instead of reducing agency to intentional, isolated actions of autonomous beings, less human-centred and non-sovereign definitions are needed to understand agency within an assemblage of collective, individual, and material forces. Jane Bennett, for example, proposes "a kind of distributive monism where organic and inorganic possess shares of agency" (463).[48] Diana Coole suggests the term "agentic capacity" to refer to actants as anything that is able to "make a difference, produce effects and affects, alter the course of events by their action" (459). Although climate change has such agentic capacity, it does not have one single body, shape, or entity that alters the course of events. Instead, climate change exposes the many different material forces of the Earth. Understanding agency as a materially distributed phenomenon that emerges in an assemblage of different related forces is helpful in examining the depiction of the non-human

[48] Bennett uses the example of a vast blackout in the United States to reframe agency as "vitalism" or "entrenched materialism." The blackout illustrates a "world where agency is distributed along an ontological continuum of beings, entities, and force, and it offers an example of what it means to say that a grid lives a life of its own" (452).

world in cli-fi. Rethinking the relationship between matter and text is paramount for articulating this kind of agency.

Bruno Latour's thinking about the changing role of the Earth in times of ecological crisis is helpful to further address the formal strategies that authors of cli-fi texts experiment with to respond to the question of narrating non-human agencies. His article "Agency at the Time of the Anthropocene" is particularly helpful because it addresses issues of language and semiotics. First, Latour draws on Michel Serres' ecocritical philosophy to explain how subject and object positions are shifting as human agents encounter the Earth as non-human agent. He places semiotics within a specific kind of ontology and explains that "what semiotics designates as a common trading zone – that is, morphism – is a *property of the world itself* and not only a feature of the language about the world" (12). In this regard, semiotics as "morphism," an already inherent feature of the world, exceeds the realm of language, text, or discourse. Latour further explains that literary texts can blend traits of subjectivity in a way that inhibits readers' abilities to distinguish between objects and subjects, which allows for a portrayal of actants and their forms before they participate in a broader network of actors:

> What semiotics designates as the source of all transformations visible in texts is what I call 'morphisms,' or better 'x-morphisms;' the 'x' standing for the first part in compound words like 'anthropo-,' 'angleo-,' 'phusi-,' 'bio-,' and 'ideomorphisms.' What really counts at first is not the prefix but the word 'morph; that means *form* and *shape*. The point is that the *shape* of a human subject […] is not better known beforehand than the *shape* of a river, of an angel, of a body, or a brain releasing factor. This is why it makes no sense of accusing novelists or scientists or engineers of committing the sin of 'anthropomorphism' when they 'attribute agencies' to 'what should have none.' It is just the opposite: if they have to deal with all sorts of contradictory 'morphisms,' it is because they try to explore the shape of those unknown *actants*. Before those actants are provided with a style or genre, that is, before they become well-organized actors, they have, if I dare say it, to be brewed, mashed, and concocted in the same pot. Even the most respectable entities – characters in novels, scientific concepts, technical artifacts, natural features – are all born out of the same witches' cauldron because, literally, that is where all of the *shape-changers* reside. (12)

From this perspective, anthropomorphism can serve as a way to story the agency of non-human beings in literary texts. It becomes a tool for exposing the specific shape or form of different actants in order to do justice to their similarities and differences. Using Latour as a framework to analyze cli-fi, Trexler identifies narrative as a shared feature of scientific practice and practice of literary writing. He explains that "literary character and literary things don't precede the narrative, but rather take their meaning from a network of other characters and things" (*Mediating Climate Change* 211). Trexler defines the role of literature not only in terms of an imaginary space, but also attributes a mediating function to it:

> But when fiction is understood as a collection of mediations of things, both its artifice and its truthfulness come into focus. Novels artfully invoke—mediate—our technologies for mediating things. By integrating technical ways of knowing the world—fishing, ecological surveys, local myth, and so on—into narrative, fiction allows us to explore the making of the real. (216-17)

The literary texts in this chapter experiment with different ways of representing the agentic capacities of climate change. Each text develops specific narrative and formal strategies to address how the relational forces of non-humans are (re)distributed in the face of climate change. While Schätzing and Trojanow approach the non-human in terms of narrative logic and give shape to it through anthropomorphic language, Ehrlich instead focusses on metatextual practices to point to the limitations of language. My analysis of these three texts will critically examine their different literary strategies and inquire about the problems and potential of using language to articulate the non-human agentic forces of climate change.

A common way that cli-fi novels such as *The Swarm* tend to imagine climate change is in the form of encounters with parts of the material world that are affected by climate change. Through these – oftentimes scientifically framed – encounters, the non-human becomes part of the narrative. Although such an approach leaves room for the non-human to some extent, its

representation is very much tied to elements of human drama and limited to the constraints of the traditional narrative features of the novel. Imagining climate change beyond the human requires rethinking modes of storytelling in eco-materialist terms. For example, the key idea of "storied matter" brings to the fore the expressivity of different kinds of matter, such as rivers, glaciers, and forests. According to Serenella Iovino and Serpil Opperman, "[storied matter] is a material 'mesh' of meanings, properties, and processes, in which human and nonhuman players are interlocked in networks that produce undeniable signifying forces" (1-2). Storied matter is not simply used metaphorically to describe culturally constructed agencies. Instead, the process of storytelling takes place in a space of co-creation and meaning-making where the human and non-human form networks. Meaning and matter are interlinked, and the human becomes part of a collective that is semiotic and material (Abram 270-272). Applied to literature, this notion of storytelling as part of a material-semiotic world makes space to think about the non-human within a text without reverting back to dualistic and anthropocentric modes of thinking. Through the lens of material ecocriticism, literary texts can potentially feature storied matter while simultaneously existing as part of the physical world – examining "matter both *in* texts and *as* a text" – and "trying to shed light on the way bodily natures and discursive forces *express* their interaction whether in representations or in their concrete reality" (Iovino and Oppermann 2; emphasis in original).

While the concept of storied matter is helpful for decentering anthropocentric perspectives, the "storied" part is always tied to language or the filter of human interpretation. Raipola, who approaches the issue of narration and matter from the perspective of cognitive narratology and material ecocriticism, suggests shifting our focus from interpreting agency in semiotic terms to asking what is lost when matter becomes narrativized. What are the limitations of representing non-human agency in the form of a story? Keeping in mind this critique, my analysis attends to

the gaps that emerge in the three texts as they grapple with representing material and non-human agencies in their narrations of climate change. To identify these gaps, I consider agency as the entanglement of human and non-human spheres and narrative as the filtering of the material. My reading of non-human agencies in literary texts draws from Raipola's distinction between agency as "intertwined, systemic behaviour of material objects and organisms" and a "semiotic agency" ("Unnarratable Matter" 277-88). The latter is "an attribute assigned to someone or something in narrative representation," and "even though these narratives are based on the actual agency of creative matter, they are bound to narrative logic, which ultimately fails in its representation of the complex causality of material systems" ("Unnarratable Matter" 277). Raipola concludes that "narrative representations of matter inevitably leave out important details, disentangle significant interdependencies, or simplify the ongoing emergence and emergency of the material world into linear stories of cause and effect" ("Unnarratable Matter" 278). Drawing from this critique, this chapter asks both what is gained and what is lost when we narrate and represent the non-human.

II. Yrr Agencies: Exploring other-than-human organisms in *The Swarm*

In *The Swarm*, techno-scientific and capitalist notions of nature as a resource to be controlled, mastered, and exploited are in tension with expanded notions of agency that do not subject the natural world to anthropocentric hierarchies. Whereas the first half of the novel focuses on extractivism and the ways in which humans view themselves as a superior species, the second half is about the emergence of an intelligent non-human life form, the yrr, that challenges and ruptures this anthropocentric worldview. The yrr act as many when they infect the bodies of animals, such as whales or lobsters, controlling the individual animal's behaviour to launch attacks against humans or use them as carriers of poisonous substances. They act as one when they

aggregate and appear as an organism that can change its shape and is forming "a conglomerate of billions of amoebas" (700). By demonstrating how the yrr complicate notions of agency as both individual and collective, the text seeks to give form and shape to non-human agencies.

At the core of discussions about the yrr are questions concerning the ways in which humans can gain access to and acquire knowledge about them. Drawing heavily from network and swarm theory, Schätzing narrates the non-human within a scientific discourse that sits up against socio-cultural discourses. Science and particularly scientists as mediators of knowledge are important components of the novel's engagement with non-human agencies. For example, molecular biologist Sue Oliviera analyzes samples of seawater to better understand "the nature of the mysterious substance" (634). Technologies, such as microscopes, make it possible to gain access to complex organisms that are part of the planetary ecosystem:

> What was seawater anyway? If you looked at it closely through a modern fluorescence microscope, it seemed to be made of a thin gel. A chain of interconnected macromolecules ran through every drop like joined-up suspension bridges. Countless bacteria made their watery homes on the sheets and films that stretched over bundles of transparent fibres. (634)

This microscopic view allows readers to access the maritime environment depicted in the novel while framing it using familiar terms, such as *suspension bridge* or *home*. The use of active verbs (i.e., run through) to describe the seawater bacteria animates the non-human and echoes Latour's notion of 'morphism.' On the one hand, scientists like Oliviera use scientific methods to gain deeper knowledge about the yrr's intelligence and are attentive to the ways in which it expresses itself. Marine biologist Sigur Johanson, for example, wants to understand "how they might perceive our threat to their habitat" and "achieve their goals" (586) and uses rainforests to illustrate his theory that the yrr are a collective intelligence using large organisms to achieve their goals. On the other hand, the scientists only consider nature as active when it has similar characteristics to

humans, such as goal-orientedness or intelligence. In addition to sparking scientific research on non-human intelligence, the yrr is presented as a threat to the status of the human species and as an antagonist, which assigns human-like agency to the non-human world. Agency is once again defined in human terms as putting one's existence above all others, refusing to co-habit, and seeking revenge.

As the American government takes on the leading role in dealing with the yrr and creates an international scientific task force, anthropocentric notions of fighting back and regaining dominance over the planet demonstrate how deeply ingrained ideas of exclusively human agency are in Western thinking. The human drama caused by the actions of the yrr unveils the values that underpin notions of human exceptionalism and mastery. War rhetoric, paired with a strong emphasis on American nationalist identity and religious ideology, illustrates these anthropocentric values particularly well. The U.S. president predicts a "war on the yrr" (511) calling the anomalies caused by them "a test for all humanity" (508). He quotes the Bible verse Genesis 1:28 ("Replenish the Earth, and subdue it.") to justify humanity's need to defend itself "in the final battle in the fight against evil" (508). Lieutenant General Judith Li, who is in charge of the task force, further embodies American supremacy and its religious undertones. For her, the U.S. is the only country that offers an "enduring model of national and international order that works for every individual in every single society" (830) and therefore needs to take charge "to liberate the planet from the yrr" (831). In her eyes, "even agreeing to coexist would be an admission of failure – a sign of our defeat, the defeat of humanity, of our faith in God and the world's faith in American supremacy" (831). The yrr are portrayed as enemy number one. According to literary critic Gregers Andersen, stories of nature's revenge are a common narrative template within cli-fi (42-50). In such narratives, non-human forms of agency become a powerful way to judge humanity for

environmentally destructive behaviours, which, according to Andersen, opens up new possibilities to the non-human world. In *The Swarm,* two groups are at war in a battle for governing the Earth. Using stereotypes about American nationalism, the novel narrates the agency of the non-human through the filter of socio-cultural conceptions and ideologies. Presented as Other, the yrr is locked into a single role as anthropomorphized antagonist from a human-centred perspective that views the natural as separate from the sphere of the human.

The portrayal of the yrr as alien and monstrous, and the comparison between the ocean and outer space as impenetrable spheres of the Other that runs through the novel[49] further exemplify how Schätzing uses literary tropes to depict the non-human. The yrr[50] are compared to "a huge headless snake" (694) with "hundreds of thin, whip-like tendrils extended from its body" (695) which alludes to the monster figure Medusa in Greek mythology. Descriptions of the sea as "full of monsters" (337) and of tsunamis as instilling "fear into the most rational mind" (337) echo revenge narratives of water rising against humans, which have a long tradition in literary and cultural conceptions of the natural world. On the one hand, the novel represents the non-human through a non-critical anthropomorphic lens, reducing its capacities to those of humans like intelligence and revenge, which is a different anthropomorphism than the one defined by Latour. On the other hand, it critiques dominant anthropocentric understandings of nature by contrasting the portrayal of the non-human as vengeful monster with other and less anthropocentric ways of narrating the yrr.

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[49] The last and fifth part of *The Swarm*, entitled "Contact," begins with the following quote from planetary scientist Carl Sagan: "The search for extraterrestrial intelligence is a search for ourselves." It reminds readers that human notions of species identity rely on non-human otherness. The yrr not only disrupt and undo notions of human exceptionalism but also reinforce them. New kinds of human and non-human species identities sit up against the idea of entering a war of the worlds with the yrr.

[50] In the German original, the novel uses the plural form ("die Yrr" instead of "das Yrr") to refer to the yrr as a collective. However, when the scientists discuss how they analyze specific cells that make up the yrr collective, they use the singular.

The novel sometimes pushes against an anthropocentric lens that is deeply rooted in capitalist Western worldviews. In this way, it contributes to a "critique of modernity's anti-animistic understanding of the non-human world as objects which humans have the right to exploit for their own purposes" (Andersen 44). For example, it features non-human otherness on the level of content (i.e., descriptive passages of the yrr as intelligent species narrated by an omniscient narrator or as part of dialogues between scientists), which lays out the issues of narrative linearity that Schätzing tries to resolve through a play with form in the final scenes of the novel. The second half of Schätzing's novel features sections that move away from anthropocentric strategies of storytelling and that defamiliarize the narrative structure by shifting perspective and disorienting readers. The three subheadings *Dreams*, *Collective*, and *Ghosts* in the last chapter point to this shift as they radically differ from the novel's other headings, which include dates and specific geographical locations. The linearity of the narrative is interrupted by depictions of the interdependency of human and non-human agents within shared environments. Because the final scenes of the yrr-human encounter are set in the depths of the ocean, an environment where humans rely heavily on technology to survive, humans become the Other. This reversal transforms the narrative into a kind of "flexible macroform" that allows the human to be placed "into the fold of the non-human world" (Carraciolo 3).

The encounter between scientific journalist Karen Weaver and the yrr illustrates particularly well the type of "formal configuration through which the quintessentially human practice of narrative can channel our capture in nonhuman processes" (Carraciolo 3.) In a submersible, Weaver survives the sinking of the *Independence*, the ship that housed the scientific-political task force. She realizes that she needs to adapt to this maritime environment, feeling like "an astronaut trying to illuminate the universe with the help of a torch" (847). As she moves around

in an alien environment in a dream-like state, she critiques the ways in which humans have ignored other-than-human species and she becomes aware of humanity's place within the larger ecosystem:

> All mankind is trapped within a waking dream of a world that doesn't exist. We live in an imaginary cosmos of taxonomic tables and norms, incapable of perceiving nature as it really is. Unable to comprehend how everything is interwoven, interlinked and irretrievably connected, we grade it and rank it, and set ourselves at the head. To make sense of things, we need symbols and idols, and we pronounce them real. We invent hierarchies and gradations that distort time and place. We have to see things in order to comprehend them, but in the act of picturing them we fail to understand. Our eyes are wide open, and yet we are blind. (847)

This passage reflects ecological thinking on a thematic level and addresses the issue that some kind of human logic is always applied to the non-human (i.e., taxonomies), which does not attend to parts of the natural world that cannot be accessed through this logic.

Weaver realizes that she is a tiny part of a "super-organism," and views the world as "a spectrum of diverging similarities" (850), which leads to a shift in narrative perspective:

> What are you, Karen Weaver? I'm the only human life-form for miles around – unless you count Rubin, who's not a life-form any more. You're a particle. One among countless different particles. In the same way as no cell is identical to another, no human is identical to you. There is always a difference somewhere. (850)

Here, the narrative zooms in on the level of particles, which displaces a human perspective and instead provides a microscopic point of view. As Weaver navigates the bottom of the ocean, she thinks about notions of human time becoming obsolete in this non-human maritime environment:

> A particle doesn't ask how long things take. A particle simply moves or stays still. It follows the rhythm of creation, an obedient servant to the whole. The obsession with duration is peculiar to humans, a doomed attempt to defy our own nature, to separate out the moments of our lives. The yrr aren't interested in time. They carry time in their genome, from the very beginnings of cellular life. (855)

Weaver's human logic no longer applies since she is reduced to a particle that "follows the rhythm of creation, an obedient servant to the whole" and "the yrr aren't interested in time" (855). In this section of the novel, the narrative switches between the micro and the macro. It zooms in on Weaver's thoughts and the size of particles, and then zooms out, adopting a global, geological perspective, which breaks with the linearity of the previous chapters. Over the course of ten pages, the story of the particle "moving in time and space" (850) is foregrounded, and concepts, such as time, are called into question and situated within an ecological worldview where human and non-human co-habit the planetary ecosystem.

This story of "the conscious ocean" is presented as part of a much longer planetary history and challenges anthropocentric notions of agency and storytelling. The text 'mimics' the movements of particles in the ocean currents as it adopts a more fluid narrative perspective and experiments with form:

> One thousand years, little particle. More than ten generations of humans, and you've circumnavigated the world. One thousand trips like that, and the seabed will have renewed itself. Hundreds of new seabeds and seas will have disappeared, continents will have grown together or pulled apart, new oceans will have been created, and the face of the world will have changed. During one single second of your voyage, simple forms of life came into being and died. In nanoseconds, atoms vibrated. In a fraction of a nanosecond, chemical reactions took place. And somewhere amid all this is man. And above all this is the yrr. The conscious ocean. You've circumnavigated the world, seen how it was and how it is, becoming part of the eternal cycle that knows no beginning and no end, only variation and continuation. From the moment it was born, this planet has been changing. Every single organism is part of its web, a web that covers its surface, inextricably linking all forms of life in a network of food chains. Simple beings exist alongside complex life-forms, many organisms have vanished forever, while others evolve, and some have always been here and will inhabit the Earth until it is swallowed by the sun. Somewhere amid all this is man. Somewhere within all this are the yrr. (858)

A second-person narrative complicates the difference between the individual "you" and the collective "they," allowing for new kinds of distributed and entangled agencies to unfold. The text magnifies the particle's voyage and experiments with narrating vast spatial and temporal scales,

moving away from a focus on Weaver and a linear narrative arch to "a mass of water that's eighty times bigger than the Amazon" (856). Schätzing uses multiple tenses (present, past perfect, simple past, and future present tense) to break up the arc of his own novel's story. Tracing the cyclical rhythm of oceanic streams that span over millennia, other-than-human agencies come to the fore. For example, the agentic qualities of the ocean as matter that articulates itself are at the centre of the passage cited above. Moreover, the novel's depiction of Weaver's intimate encounter with the yrr presents humans in a space of coexistence and reveals the ways in which "our species is deeply intertwined with the nonhuman realities of geology, the climate, and the biological history of life on Earth" (Caracciolo 11). Humans are reduced in scale and compared to particles bound up in the larger ecosystem, and the reader no longer knows who or what is narrating the text. Human interests and drama are erased from this description of the scales of the planetary ecosystem as a whole. The novel's experiential approach to narrating the non-human outside anthropocentric binaries marks "a cognitive shift from linear to mesh-like thinking," which "can provide key affective impetus to the ecocritical project" (Caracciolo 20). The description of the yrr as "symmetrical configurations of light, flashing combinations of lines and dots," looking like a "living computer, whose innards and surface are processing calculations of staggering complexity," and "thinking for everything around it" (862) combined with descriptions of its organic, squid-like form, challenge the reader to fit this living being into any one category. Agency emerges as distributed "as far and in as differentiated a way as possible – until, that is, we have thoroughly lost any relation between those two concepts of object and subject" (Latour 15).

At the same time, the novel continues to rely on recognizable forms in its description of differentiated and distributed agency. For example, when Weaver finally encounters what she calls "the queen" (862) of the yrr, she experiences "a vision of beauty" (861) and hears Claude

Debussy's waltz *La plus que lente* in her head as she watches the "shimmering blue bell of enormous proportions, high above her like a heavenly vault" (861). Naming the yrr "queen" anthropomorphizes the non-human and shows that the text falls back on familiar hierarchical language to narrate the non-human as a character. It reminds the reader of similar language used to describe the social organizations of bees, as in the 'queen bee.' Although this gendered language evokes the idea of nature as inherently feminine, the text critiques this language ("She? The human mindset takes over so quickly," 865). It even goes so far as to address the problem of non-critical anthropomorphism when Weaver "remembers Crowe's warning about the temptation to humanise aliens, about representations of otherness that are really mirror images, about the need to make room for bolder visions of alien life" (861).

The impossibility of narrating the agency of the non-human world without some kind of human interpretation causes tension between different filters of interpretation (i.e., scientific, political, aesthetic, etc.). According to Andersen, the novel endorses the idea that anthropocentrism is "a path that can no longer be taken, but must be replaced by an ecocentrism in which humanity once again comes to interpret itself as part of a bigger whole" (50). Although narrativizing the yrr does recognize and give shape to their agency, it locks the non-human Other in a single role. Moreover, Weaver's perspective anchors the non-human in narrative logic, and the novel ends with an excerpt from a diary entry, a genre that traditionally focuses on human experience, written a year after the sinking of the *Independence*. The novel points to the limitations of combining narrative logic with less anthropocentric thinking about material non-human agencies, while at the same time critiquing dualist and anthropocentric worldviews.

III. Looking at glaciers in *The Lamentations of Zeno*

Unlike *The Swarm*, which chooses to focus on an unknown species to narrate the non-human in or as climate change, Ilija Trojanow's novel *The Lamentations of Zeno*[51] adopts the image of majestic glaciers melting in the Antarctic, an over-featured example in environmental campaigns that are now part of a global climate imaginary. The novel tells the love story of scientist Zeno Hintermeier and the glaciers he studies. The German title, *Eistau*, which translates to *Ice Thaw*, places the focus on the non-human, whereas the English title, *The Lamentations of Zeno*, foregrounds Zeno's emotional attachment to the glaciers and his mourning of their disappearance. The focus on ice and the process of melting in the German title points to the novel's expression of urgency and plays on the fears of climate change. The English title recalls the biblical Book of Lamentations, a text that mourns the destruction of Jerusalem through poetic elegy, which highlights Zeno's use of writing as a way of mourning and coping as he witnesses the destruction of the glaciers. Zeno shares similarities with the biblical figure of Jeremiah, who authored the Book of Lamentations, as he adopts the role of a prophet who predicts that receding glaciers foreshadow the apocalyptic end. Finally, by naming the novel's main character after a prominent Stoic philosopher, Zeno of Citium, Trojanow references a school of thought that centres around living in harmony with nature (Goodbody, "Melting Ice" 98). Thus, the English title emphasises Zeno's grief and his passion for protecting the glaciers from human destruction. *Eistau/Ice Thaw*, in contrast, suggests that the process of melting rather than a human character is central in the novel. My analysis of the text will highlight the different lenses through which the glaciers are seen: as an object of Zeno's grief and scientific study, as a feminized landscape, and as a tourist resource.

[51] All English quotes are from Phillip Boehm's translation. The German original can be found in the footnotes.

As matter that changes its form from ice to water and emits different kinds of sounds in the process, the glaciers express an "agentic capacity" (Coole 459) that differs from language as a defining feature of expression. However, by placing the focus on the main character's emotional and political response to receding glaciers as symbols of the climate crisis, the novel remains limited to human-centred notions of agency. Zeno's attempt to speak for the glaciers and his use of anthropomorphic language as he mourns their loss is problematic because it narrates the non-human from the anthropocentric perspective of a single character (unlike *The Swarm* that experiments with narrative perspective, etc.). This anthropomorphism does not explore non-human shapes or 'morphisms' (Latour) but projects human logic onto the glaciers. This is further complicated by Zeno's masculine gaze that sexualizes the non-human. He imagines the glaciers as having bodies and fetishizes them as romantic partners who need to be saved from humanity's violent behaviours. From time to time, this anthropocentric view is interrupted and nuanced on the level of form. As I will explain later, short collages of scraps of conversations, and chatter from multiple unidentified sources break from Zeno's perspective.

In his first-person account of a journey to Antarctica as a lecturer for tourists on board the cruise ship *MS Hansen*, Zeno writes about his emotional attachment to the glaciers as a passionate lover. He imagines glaciers first and foremost as beings that need to be cared for and subjects them to the gaze of a romantic partner. His thoughts, captured in notebooks, limit the glaciers to tropes that map human relationships onto the natural world. Viewing himself as "married" to the glaciers, he enjoys spending time in their presence where he "feels the glacier's full emotional force" (44).[52] He expresses his affection and passion for the first glacier that "was put in his care" by his doctoral

[52] "…um den Gletscher ungestört zu erfühlen." (34)

advisor as an "arranged marriage that in time became a union of love" (44).[53] He writes that he has been watching this particular glacier his entire life "with passionate care and precise instruments" (43),[54] and that the glacier and he "were aging together" (45).[55] He realizes that he cannot stop 'his' glacier from disappearing despite having dedicated his entire academic career to the study of glaciers. The methods of science become "woefully inadequate, and no column of figures could do any more justice to [his] devotion" (44).[56] As Zeno laments the disappearance of 'his' first glacier, he abandons a scientific view and adopts an emotional perspective that once more places the glacier within an anthropocentric relationship. He compares the sounds of a dying glacier with the decline of aging human bodies and describes himself and the glacier as an "elderly couple" (44).[57] Metaphors of illness and a doctor-patient relationship further anthropomorphize the glacier and present it as victim: "one of us was severely ill, the other couldn't do anything about it" (44)[58] and "over the years I changed into a kind of doctor who had only to look into the eyes of his patient to make the proper diagnosis" (44).[59]

Narrating glaciers through this emotional lens that focuses on similarities potentially challenges dualistic thinking and may promote a sense of care for the environment. However, this sense of care takes the human as the norm and denies these environments' agentic capacities independently from the human sphere. Trojanow's extensive use of anthropomorphism does not resemble "the touch of anthropomorphism," described by Bennett, that "can catalyze a sensibility that finds a world filled not with ontologically distinct categories of beings (subjects and objects)

[53] "…diesen Gletscher, den mir mein Doktorvater in Obhut gab, eine arrangierte Ehe, die sich über die Jahre in Leidenschaft verwandelte." (34)
[54] "Ein Leben lang habe ich ihn beobachtet, sorgfältig aus Leidenschaft und mit präzisen Instrumenten." (34)
[55] "Wir alterten gemeinsam…" (35)
[56] "…keine Zahlenreihe wurde meiner Hingabe gerecht." (35)
[57] "Wir waren wie ein altes Liebespaar." (35)
[58] "…einer von uns war schwer erkrankt, und der andere konnte nichts dagegen unternehmen." (35)
[59] "Über die Jahre hinweg verwandelte ich mich in einen Arzt, der nur in die Augen seines Patienten nlicken muß, um die richtige Diagnose zu stellen." (35)

but with variously composed materiality that form confederations" (99). Instead, the novel "is structured around a series of traditional binary oppositions" (Preece 122). The human concept of romance is mapped onto the material world, and the glaciers become the objects of a gaze that upholds anthropocentric power structures and binary thinking.

In addition to narrating glaciers through the trope of romance, the text uses Antarctic tourism[60] as a backdrop, an industry that monetizes encounters with a remote 'nature' while at the same time contributing to and benefiting from its destruction. Robert Fletcher describes this kind of tourism as "a new capitalist 'fix'" (523) and "a particular form of disaster capitalism that seeks to harness crises created by capitalist processes themselves as opportunities for further accumulation" (526). As an advocate for receding glaciers, Zeno critiques how a touristic and scenic gaze frames the Antarctic landscape in economic and aesthetic terms. On the one hand, his intimate encounters with glaciers function as a kind of re-enchantment of the natural world[61] and are in stark contrast to the disenchantment emerging not only from a scientific worldview, but also a capitalistic one that turns glaciers into commodified aesthetic backdrops to be consumed visually by tourists on expensive cruises. On the other hand, he 'consumes' the glaciers with a gaze that reduces them to objects of his desire and perceives them in problematic gendered terms.

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[60] In "Fictional Representations of Antarctic tourism and Climate Change," Hanne E.F. Nielsen provides a thorough discussion of the novel's representation of Antarctic tourism.

[61] At times, Zeno experiences nature as divine and develops a spiritual relationship to the glacial environment: "I abandoned myself to the tranquility of the ice, the clang of the water, I became a stone pressing on the ice and leaving my own imprint, and one time I was surprised to feel the urge to pray inside one of the icy cavelets that served as my makeshift chapel — not to God (and how vain a deity to command his name be held sacrosanct) but to variety and abundance (written out like that the words seem wooden, and it isn't enough to replace 'God' with 'Gaia' either)." (*Lamentations* 82)

"…überließ mich an einsamen Tagen der Eisesstille, dem Wasserklang, ich wurde zu einem Stein, der seine eigene Spur ins Eis walzte, und eines Tages überraschte mich der Wunsch zu beten, in einer der blauen Eintagskapellen, nicht zu Gott (schon dieses Wort, wie unmöglich, dieses zweite ›t‹, wie ein didaktisches Ausrufezeichen), sondern zu Vielfalt und Fülle (hingeschrieben wirkt es hölzern, es reicht nicht aus, »Gott« durch »Gaia« zu ersetzen)." *(Eistau* 61)

"Scan[ning] the glacier" (44)[62] with his eyes, associating its sounds with "melting mating calls" (58), and comparing holes in the ice to "mighty vulvas pushing deep inside the berg" (58)[63], Zeno sexualizes the Antarctic landscape and turns it into an object of a male gaze. Laura Mulvey describes the male gaze in terms of a "to-be-looked-at-ness" where "women are simultaneously looked at and displayed" (719). Even though Mulvey's definition of this gaze centres on the objectification of women in cinema, conceptions of nature as feminine and passive reinforce patriarchal norms in a similar way. Zeno's relationship to his Filipino lover Paulina, unfolding in parallel to his increasing fetish for glaciers, highlights this commonality between women and nature. His descriptions of Paulina, focused on the body and his feelings of desire, are similar to the ways in which he objectifies glaciers.[64] Through this practice of dualist thinking that ecofeminists like Val Plumwood (i.e., *Feminism and the Mastery of Nature*, 1993) and many others have looked at and critiqued extensively, glaciers get othered and reduced to a specific role (i.e., lover). The use of this common Western trope of feminizing the land points to Zeno's paternalistic way of speaking about and for the non-human and viewing nature in allegorical terms as "the site of sexual enticement and ultimate seduction" (Soper 103). Frauke Matthes (2023) addresses this problematic gendered relationship to the non-human in *New Masculinities in German Literature,*

[62] "Ich tastete ihn ihn jedesmal aufs neue ab, mit meinen Augen…" (34)
[63] "In den Seiten des Eisbergs sind ovale Öffnungen geschlagen, gewaltige Vulven, die sic him Inneren einbläuen. Schmelzende Lockrufe." (44)
[64] "…she metamorphosed into a confident chanteuse, a bundle of energy inside a cone of light, she crossed her legs and let her right shoe slide down her foot so only the silver buckle was looped over her toe, the shoes dangled and swayed and all desires were fixed on her as she sang the old hits to a plucked accompaniment with an intensity that let me draw a curtain shutting the two of us from the rest of the world." (*Lamentations* 60)
"…war sie wie verwandelt, in eine selbstbewußte Barsängerin, gebündelte Energie im Lichtkegel die Beine übereinandergeschlagen, zog sie Sehnsüchte auf sich, der Schuh baumelte von ihrer rechten Fußspitze an einer silbernen Schlaufe und schaukelte, während sie zur gezupften Begleitung Evergreens sang, mit einer Intensität, die mich einen Vorhang zwischen uns beiden und der Welt ziehen ließ." (*Eistau* 45-46)

critically examining Zeno's role as a "man, scientist, and eco-warrior" (207). She highlights the vulnerability attributed to the natural world as part of Zeno's ethical concerns:

> In fact, nature's agency depends on its gendered manifestation. To put it more bluntly: nature's worth relies on its ability to attract a man, to be desirable while remaining 'pure' and silent and, at least on the surface, untouched for the conquering traveler. At the same time, nature is vulnerable in Zeno's eyes – the glaciers are melting after all – and it needs saving from men, ignorant tourists and consumers, by a man, namely, Zeno himself. Thus, nature may have agency, but does not speak; there is no reciprocity in Zeno's relationship with it. (214)

Although the process of the ice melting dramatically affects Zeno's mental state, he does not grant glaciers agency in their own right nor an existence other than the one projected onto them by human feelings and thoughts.

While the novel can be read as raising environmental concerns about melting glaciers at the South Pole, I argue for examining more closely the aesthetic form as a way to attend to non-human agencies. Looking at the novel's form, a different type of aesthetic engagement emerges and interrupts the anthropocentric gaze that strips glaciers of an agency that is not dependent on their 'value' as the embodiment of 'nature's beauty.' The text alternates between Zeno's notebooks and short collages of what appear to be isolated lines from commercials, erotic fantasies, news channels, and radio communication with the coast guard. By experimenting with a cacophony of voices that cannot be traced back to a single source, the novel briefly undermines Zeno's anthropomorphic language and demonstrates the issue of capturing the complexities of the climate crisis and the ways of imagining this crisis. Every short chapter begins with the coordinates of the ship's position and ends with an S.O.S written in morse code. The bricolages embed the lamenting tone of Zeno's notebooks in the 'chatter' that is produced by fast-paced

capitalism[65], and feature important clues about the events that are about to unfold, namely Zeno's decision to kidnap the cruise ship, abandon the passengers, and commit suicide by jumping off the ship. These collages not only "function as an inharmonious chorus reflecting the story with the tragic end" but also "employ strategies of fragmented poetry" (Dürbeck, "Ambivalent Characters" 116). In contrast to Zeno's coherent and relatively linear notebook entries[66], the collages move quickly between ideas and images, which accelerates the text's pace:

> Pipe down, 24 percent of those polled believe that nature has its own right to exist, but the ladies of Calcutta, blackbirds are dropping dead from the sky, cut. […] Cut, two cotton candies and two carousel rides for the price of one ginger-bread heart, first the saplings burn, then the shrubby underbush, the young trees, the dead wood, and all that just fans the fire, the price never reveals the truth. We formed the O very quickly […] The wildfire reaches the flashpoint and consumes the tallest trees, it blazes away, hotter and stronger than ever, starlings are dropping dead from the sky, are sweeter by far, then comes the third fire that burns everything away, destroying all life, the third fire is the inferno that burns down the world once and for all, cut BREAKING NEWS STRANDED PASSENGERS RESCUED FROM ICE BREAKING NEWS STRANDED PASSENGERS RESCUED FROM ICE all ablaze. (100-101)[67]

The passage features a collective voice that cannot be traced to one single source and contrasts Zeno's individual and egocentric view. In addition to the telegraphic bits of local and global news, this passage features common images used in apocalyptic cli-fi, such as birds falling out of the sky

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[65] Preece interprets the collages as part of the text's politics and a way of critiquing contemporary media culture through the means of literary form: "The *Zivilisationskritik* is located in the form, rather than the content. The modern media treat all subjects in the same way, in the same voice, and in the same style. As readers or listeners we have a short attention span, hopping from channel to channel, or flicking from page to page. All information is commodified and exchange monetised. The most serious questions are debated in the same breath that transmits the most trivial news." (125)

[66] At times, the notebook becomes less linear, for example, when Zeno jumps back to childhood memories of his first encounter with a glacier or writes about flashbacks of previous relationships.

[67] "Klappe, 24 der Prozent der Befragten sind der Ansicht, daß die Natur ein eigenes Existenzrecht hat, New York liegt am Atlantik, es fallen die Amseln tot vom Himmel, Klappe. […] Klappe, zweimal Karussell zum Preis von einem Lebkuchenherz, zuerst brennen die Setzlinge, die Büsche, das tote Holz, das facht den Brand an, der Preis sagt nie die Wahrheit. Das O war bald geschafft. […] Der Brand wird heißer, verschlingt die größten Bäume, es lodert ein größeres, ein heißeres, ein mächtigeres Feuer, es fallen die Stare tot vom Himmel, und Athen liegt am Mittelmeer, dann das dritte Feuer ist das letzte, es ist das Feuer, das die Welt endgültig niederbrennt, Klappe BREAKING NEWS GESTRANDETE VOM EIS GERETTET BREAKING NEWS GESTRANDETE VOM EIS GERETTET LICHTERLOH" (75)

or wildfires, linking the melting glaciers described in the notebooks to other environmental disasters. These scenes echo Zeno's nightmares[68] and play on the fears related to climate change, creating a second narrative perspective from which the actions of the non-human world are seen.

The novel's final chapter continues this apocalyptic tone. "Tired of being human" (157)[69], Zeno commits suicide by jumping overboard because he can no longer bear living in a nightmarish state that he defines as "the realization, much much too late that you didn't do anything when you still could, when you still should have, that is hell. And there's no escape" (152).[70] As his final attempt to communicate the urgency to take action, Zeno's behaviour can be interpreted as an act of desperation to escape the reality of a climate-changed planet or as an act of resistance that is in line with his green politics.[71] After all, "only big blows are capable of jolting mankind" (157)[72] according to Zeno. Yet his decision to die with 'his' glaciers points to the problematic understanding of melting glaciers as 'dying.' Rather than 'dying,' they merge into another aggregate state and continue to display a distributed agency that affects sea levels. In addition, the novel's focus on Zeno's control over his body contrasts material notions of agency that do not view the body as a 'container' for the mind, but instead view it as matter in relation to other non-human kinds of matter.

Interestingly, the final bricolage passage repeats the phrase "the revolution will not be televised" (158)[73] twice, referencing the iconic spoken word poem written by Gil Scott Heron in

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[68] For example, Zeno dreams about holding a piece of ice that melts in his hands (*Lamentations*, 36-37).
[69] "Ich bin es leid, unter diesen Umständen Mensch zu sein." (115)
[70] "Die Einsicht, die späte, viel zu späte Einsicht, man habe nichts getan, als man etwas hätte tun können, als man etwas hätte tun müssen, das ist die Hölle. Aus ihr gibt es kein Entrinnen." (112)
[71] In addition, it seems important for Zeno to leave behind his notebook as a legacy: "Someone will find this notebook, someone will read it and decide to publish it or not." (*Lamentations*, 156)
"Irgendjemand wird dieses Notizbuch finden, irgend jemand wird es lessen, veröffentlichen oder verheimlichen." (*Eistau* 115)
[72] "Aufschrecken kann ihn [=den Menschen] nu rein großer Schlag." (115)
[73] Trojanow kept the English original here.

1971 as a political commentary on media culture. This reference suggests that the text itself tries to replicate Zeno's call to action by reminding the reader that the 'revolution' requires active participation. Imagining glaciers as anthropomorphized beings that need to be cared for while at the same time embedding this imagination within the capitalist structures that contribute to their extinction and erase them as agents complicates a single-focused political reading of the novel. Moving away from a single perspective and countering anthropocentrism, the postmodern novel discussed in the next section of this chapter is another more extreme example of experimenting with form.

IV. Insular Agencies: Re-imagining the Maldives as climate-changed space in *Malé*

While Schätzing's and Trojanow's novels experiment with narrative perspective and linear form to represent non-human agencies, Roman Ehrlich's cli-fi postmodern novel[74] *Malé* (2020, not yet translated into English),[75] adopts a very different literary technique. My aim is to examine the value of such a text in terms of how it both highlights the limitations of literature to depict the natural world and holds to the premise that language is the only way we can know that world. What is the potential of a postmodern cli-fi text for thinking differently about literature's role in the climate crisis? Set in the Maldives in the near future, *Malé* reimagines islands as climate-changed places, already partly underwater because of rising sea levels, where tourist visions of a tropical paradise are replaced by realities of environmental and social decline.[76] In many ways,

[74] The novel follows the premises of postmodernism that include "a self-reflexive acknowledgement of a text's own status as constructed, aesthetic artefact," "an implicit (sometimes explicit) critique of realist approaches to narrative and to representing a fictional 'world,'" and "a tendency to draw the reader's attention to his or her process of interpretation as s/he reads the text" (Nicol xvi).

[75] All English quotes from the novel in this chapter are my translations, with the German original in the footnotes.

[76] According to Ehrlich, *Malé* engages with "the scenic nature of the ideal vacation spot and the catastrophic scenarios that affect its future" (*Spähre*, my translation, 9). The setting of the Maldives extrapolates from recent climatological predictions that almost 80% of the country could become uninhabitable by 2050 due to global warming (see IPCC report 2022), which, together with the text's focus on the figure of the island surrounded by rising sea levels, immerses the reader in a global contemporary climate change imaginary. Ehrlich defamiliarizes "the projections, desires, and

Ehrlich's postmodern narrative of the Maldives problematizes the idea of 'storied matter' and reconfigures the material as that which escapes the constructive work of language. I will focus on the ways in which water troubles the notion of situated, embodied agency as it gradually erodes the island's infrastructure and affects its inhabitants. As I will illustrate, the force of water ruptures the relationship between words and the world on a metatextual level in this novel.

Malé addresses environmental issues through the theme of rising water levels, but refuses the possibility of literature to describe and narrate climate change. Instead of imposing narrative logic onto the non-human world, the text creates a space of uncertainty where reality is becoming a discursive production. The novel features intertextual references and self-reflexive texts (i.e., e-mails, diary entries); mentions real historical events (i.e., the 2009 Underwater Cabinet Meeting in the Maldives to draw attention to the danger of rising sea levels as a result of climate change) and actual people (i.e., Huguette Gaulin, a Canadian novelist who set herself on fire to protest environmental destruction); uses irony to critique the environmental destruction caused by tourism; disorients readers (i.e., unreliable narrators, unfinished plotlines, long incomplete sentence structures, repetitions); and draws attention to itself as a product of writing. These postmodern techniques expose narrative as "a distinctly human artifact which encodes the values of particular human communities" (Bergthaller 7) and highlight the filters that mediate conceptions of climate change.

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ideas of paradise that accompany this place" (*Spähre*, my translation, 9). and illustrates climate change as a deconstructive force on an island undergoing a slowly unfolding apocalypse. Moreover, the novel reveals the ways in which climate change affects structures of power. For example, the economic dependence of the two groups that make up Malé's society, namely the local population with its militia groups ("die Eigentlichen"), and exiles or dropouts from Western countries ("die Ausgewanderten" or "Austeiger"), is reversed. The survival of the Westerners who find themselves "somehow stranded in the former capital of the Maldives" because they are "on the run, hiding from the public eye, a prison sentence, the wrath of a family or the retribution of an opposing clan" (*Malé* 176) depends on the local population, whereas, in the past, the country's economy depended on tourism.

Malé replaces conventional linear narrative structures with absurd plotlines that come to nothing and fragments of short scenes that focus on individual characters. The novel features an American literary scholar (Frances Ford), a German lyricist (Judy Frank), an actress (Mona Bauch), and a person who is confused by the symbolic realm of language (Elmar Bauch). These characters function as 'vehicles' to question the notion of objective reality. For example, when Ford meets a film crew shooting a documentary about Mona Bauch, she reflects on how meaning is ascribed to the island through language: "As if reality, which after all has always seemed suspicious and unreal to her, was now unmasked as a gag, a staging, a misdirection for the amusement of our viewers at home." (158)[77] In this way, the novel illustrates the premise that "climate change, as a natural (albeit anthropogenic) phenomenon possesses no intrinsic narrative properties" (Bergthaller 1). By explicitly addressing this issue, the novel makes readers aware of the gap between language and reality.

Although climate change escapes the narrative point of view, it does become visible as characters navigate the uncanny flooded spaces of the island. For example, the novel describes in detail the effects of water levels rising. In the city of Malé, "the water has been almost knee-deep in the streets for a few days," (12)[78] and "at each street canyon," one encounters "the same image of rolling crests of waves, crisscrossed by white veins of spray and foam, their crashing collapse and being sucked back into the next breaker" (20).[79] Rising sea levels affect[80] how people inhabit the island as "the sea gnaws and works on the foundation of the city, the asphalt of the streets, the

[77] "Als wäre die Wirklichkeit, die ihr doch ständig verdächtig und unwirklich vorgekommen ist, jetzt entlarvt als Gag, als Inszenierung, als Irreführung zur Belustigung unserer Zuschauer zuhause." (185)
[78] "Seit ein paar Tagen steht das Wasser fast knietief in den Straßen." (12)
[79] "Am Ende einer jeden Straßenschlucht dasselbe Bild von anrollenden Wellenbergen, von weißen Adern aus Gischt und Schaum durchzogen, ihr krachendes Zusammensinken und Zurückgesaugtwerden in den nächsten Brecher." (20)
[80] Presenting the ocean as a gnawing creature that takes over the island, Ehrlich personifies the ocean. However, as my analysis will show, he uses metaphorical language alongside other ways of imagining the force of the ocean and critiques the role of language in capturing the non-human world by drawing attention to the limits of metaphors and through the use of postmodern techniques.

concrete of the flood walls, the buildings and the dead stone corals on the reef of the islands" (202).[81] Water is slowly eroding human-made infrastructures and the ocean "no longer lies there peacefully, flat and turquoise as on the brochures of yesteryear, but is wild and completely contaminated by the waste of people in constant motion" (19).[82] The constant streams of water that take over all the island spaces are described with active verbs, contrasting the characters' passiveness and sense of forlornness:

> At the same time, she [Ford] feels that she has less time left before the all-encompassing inertia, the sultry weather hanging heavy overhead, the rain, the gnawing waves, and the spring tides swept across the island by a pale moon will have completely consumed her drive, her strength, and her will. (12-13)[83]

The relationship between body and environment becomes central as water alters the living conditions for the island's inhabitants: "the sea penetrates their noses" and "each breath is saturated with the salty taste of all the organic matter that ever perished and slowly dissolved in that salt water […] oily and caustic, the taste trickles from the nose down to the throat, filling the oral cavity and coating the tongue with a greasy film" (19).[84]

Yet, these ephemeral moments of water displaying its agency are resistant to language and acts of interpretation. The text points to its separation from the natural world, but also to literature's powerlessness for representing that world:

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[81] "Das Meer nagt und arbeitet am Fundament der Stadt, dem Asphalt der Straßen, dem Beton der Flutmauern, den Gebäuden und den toten Steinkorallen am Riff der Inseln." (202)

[82] "… die ewige Unruhe des Indischen Ozeans, der kaum mehr friedlich, flach und türkisfarben daliegt wie auf den Prospekten von früher, sondern wild und völlig verseucht vom Abfall der Menschen in ständiger Bewegung ist. (19)

[83] Gleichzeitig hat sie das Gefühl, dass ihr weniger Zeit übrig bleibt, bevor die umfassende Trägheit, das schwer über den Köpfen hängende schwüle Wetter, der Regen, die nagenden Wellen und die von einem bleichen Mond über die Insel hinweggezerrten Springfluten ihren Antrieb, ihre Kraft und ihren Willen vollständig aufgezehrt haben werden." (12-3)

[84] "Jeder Atemzug ist satt vom salzigen Geschmack des Organischen, das in diesem Salzwasser je verendet ist und sich dann darin aufgelöst hat. Tranig und scharf rinnt dieser Geschmack den Atmenden aus der Nase in den Rachen hinab, füllt den Mundraum aus und legt sich als öliger Film auf die Zunge." (19)

> Elmar Bauch feels surrounded by incomprehensibilities. The sea he looks at and which is constantly present everywhere on the island every day, the straight blue line of the horizon in all directions, would actually be a simple matter and yet it cannot be described in words. Bauch fears that his own inner monologue, despite all rejection, has been virtually poeticized by reading the poems of the German lyricist, while he thinks that the sea, as an eternally insatiable devourer, is not available for queries. That it keeps its secrets from people and only out of unpredictable whims now and then spits out someone or something to the shore to create facts where before there had only been speculations. (166)[85]

As in the previous examples discussed above, the text adopts metaphorical language as one way to narrate the non-human world and give shape and form to something as fluid as the ocean while at the same time embedding this use of metaphorical language within postmodern narrative structures to critique it. By bringing together multiple narrative threads that create gaps, the text points to the un-narratability of that which lies outside the sphere of human experience.

This metatextuality echoes Raipola's critique of using narrative to represent non-human agency:

> Stories, instead of pre-existing in the matter as meaningful units to be picked up by us, are employed in order to make sense of the complex interchanges between innumerable human and nonhuman agencies. Matter can, sure enough, produce meaningful actions, which can then be represented and interpreted as stories by human individuals and collectives. The problem with nonhuman agency, however, is exactly the fact that these actions are not compatible with narrative explanations, and for this reason, instead of positing these nonhuman "voices" as our narrative partners in crime, it might be more reasonable to recognize our own limitations in interpreting them. ("Unnarratable Matter" 268)

Ehrlich's writing exposes the failure of trying to represent material environments. It reveals the 'un-narratability' of climate-changed spaces that have become hostile to humans by portraying the formerly familiar as unfamiliar, and foregrounding abandoned and flooded spaces (i.e., hotels,

[85] "Elmar Bauch fühlt sich umstellt von Unverständlichkeiten. Das Meer, auf das er schaut und das an jedem Tag auf der Insel überall ständig präsent ist, die gerade blaue Linie des Horizonts in allen Richtungen, wäre doch eigentlich eine einfache Angelegenheit und ist dennoch mit Worten nicht zu beschreiben. Bauch befürchtet, dass sein eigener innerer Monolog, aller Ablehnung zum Trotz, von der Lektüre während er denkt, dass das Meer, als ewig unersättlich Verschllingendes, für Rückfragen nicht zur Verfügung steht. Dass es seine Geheimnisse vor den Menschen aufbewahrt und nur aus unvorhersehbaren Launen heraus hin und wieder einmal jemanden oder etwas ausspuckt an die Ufer, um Tatsachen zu schaffen, wo vorher nur Spekulationen gewesen sind." (166)

museums, office buildings) as they become sites of decay. For example, the novel features excerpts from one of the character's diaries, where he tries to describe water permeating the island in different forms without using already existing narrative templates. This character, Judy Frank, "had wished to find a language that would transcend the usual disaster tourism and the fascination of ruins, expressing the nature of this place that human beings have ceded to fungi and mites to build their microscopic societies" (19).[86] But how to adopt a microscopic perspective that attends to processes unfolding without human participation, such as the formation of fungi in wet environments? By acknowledging these difficulties, the novel challenges the narratability of non-human agents.

During a conversation with Mona Bauch, Frank further reflects on his way of coping with environmental crisis and the apocalyptic language used to make sense of it, listing well-known images of climate change:

> At some point I didn't watch anything else, only weathermen and weatherwomen in front of animated maps and videos of trucks overturning on icy highways, of sparks flying from forest fires in California or the Amazon, volcanic eruptions, tidal waves, high-waves, droughts, mudslides, breaking ice floes, melting glaciers, oily seabirds, shimmering dirty water rivers, thunderstorms, tornadoes, the death of fireflies and bees. And in all of this, of course, the brutal apocalyptic Biblical language available to these weathermen and weatherwomen was always used. This, I thought, is how the language of books survives: as dramatic doomsday rhetoric on weather portals and in terrorist manifestos. (189)[87]

[86] "Er hatte sich gewünscht, eine Sprache zu finden, die über den üblichen Verfallstourismus und die Faszination für Ruinen hinaus darstellen könnte, was das für ein Ort ist, den die Menschen den Pilzen und Milben zum Aufbau ihrer mikroskopischen Gesellschaften überlassen haben." (19)

[87] "Ich habe irgendwann gar nichts anderes mehr geschaut, nur noch Wettermänner und Wetterfrauen vor animierten Karten und Videos von umstürzenden LKWs auf vereisten Autobahnen, vom Funkenflug der Waldbrände in Kalifornien oder dem Amazonas, Vulkanausbrüchen, Flutwellen, Hochwaasern, Dürren, Schlammlawinen, zerbrechenden Eisschollen, schmelzenden Gletschern, öligen Seevögeln, schillernden Schmutzwasserflüssen, Gewittern, Tornados, vom Tod der Glühwürmchen und der Bienen. Und bei alldem wurde natürlich immer die brutalapokalyptische Bibelsprache verwendet, die diesen Wettermännern und Wetterfrauen verfügbar war. So, dachte ich, überlebt die Sprache der Bücher: als dramatische Untergangsrhetorik auf den Wetterportalen und in den Manifesten der Terroristen." (189)

Frank is highly critical of this language and the role of literature in grasping the problem of climate change. He adopts a radical position in terms of the role of writing in a climate-changed world:

> If writing can still be about anything, then it is about what one cannot immediately recognize, the ignorance, the helplessness, the silence of things, the secrets behind the symbols and the fear that emanates from this ignorance, from the emptiness and the meaninglessness. (184)[88]

This postmodern stance breaks with the readers' expectations regarding storytelling and points to the gaps in perceiving the world as a story.

It is true that *Malé* illustrates the notion of storytelling as – in the words of Ehrlich's characters – a "terrible gesture" (184)[89] and abounds with self-reflexive references that strip this 'gesture' of its symbolism.[90] But it also complicates the space of the symbolic when it acknowledges that words are related to affect. The characters' reactions to past conceptions of the Maldives as idyllic tourist destination and vibrant ecosystem demonstrate particularly well how the text uses language to evoke a sense of loss. Over several pages, characters read excerpts from an old tourist guide that describes the Maldives as one of "the best diving areas of the world"

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[88] "Wenn es noch um irgendetwas gehen kann beim Schreiben, dann doch um das, was mann eben nicht sofort erkennen kann, das Nichtwissen, die Ratlosigkeit, die Schweigsamkeit der Dinge, die Geheimnisse hinter den Symbolen und die Angst, die von diesem Unwissen, von der Leere und der Sinnlosigkeit ausgeht. (184)

[89] . Diese schreckliche Geste des Geschichtenerzählens." (184)

[90] Frances Ford's perspective on the island as a remix of different symbols and ideologies is an excellent example of this self-reflexivity: "In the light of her research and in view of the symbols exhibited everywhere on the island, on the walls in the Blauer Heinrich even still on the skin of the disembarked, the worshipping of the moon and the flower fetish, everything here seems to her like a re-staging of the xth order ('Romanticism to the nth degree,' Ford thinks in her mother tongue and wonders, if that wasn't an album title at some point), as the - as always - uncritical adoption of all the ideological junk from Novalis, Byron, Pushkin, via the socialist workers' poets of the GDR, to the cornflowers on the lapels of the right-wing national poets and politicians of the post-transition and post-century [...]." (271)
"Im Lichte ihrer Forschung und in Anbetracht der überall auf der Insel, an den Wänden im Blauen Heinrichund selbst noch auf der Haut der Ausgestiegenen ausgestellten Symbole, der Mondanbetung und des Blümchenfetischs, erscheint ihr alles hier wie eine Re-Inszenierung x-ter Ordnung ('Romanticism to the nth degree,' denkt Ford in ihrer Muttersprache und fragt sich, ob das nicht irgendwann mal ein Albumtitel gewesen ist), als die - wie immer - kritiklose Übernahme des ganzen ideologischen Gerümpels von Novalis, Byron, Puschkin, über die sozialistischen Arbeiterpoeten der DDR, bis hin zu den Kornblumen an den Revers der rechtsnationalen Nationaldichter und Politiker der Nachwende- und Nachjahrhundertwendezeit." (271)

(123)[91] and its "its unique marine wildlife" (124).[92] Struck by the irony of the island's environmental decline, they burst into laughter. As the excerpt continues with an extensive list of the different kinds of species that used to live in the coral reefs, an ecosystem that forms the "foundation of all life" (124)[93], their reaction shifts and "the reading of this death list of the many, who have long since ceased to be discovered and observed in the water around the atolls, has turned their stomachs and driven out their cheerfulness" (124).[94] The tourist guide has become part of an archive and a historical document of species loss. Although the novel rejects the idea of giving voice to the non-human, this "death list" draws the reader's attention to the ways in which texts can evoke feelings of loss and mourning, creating emotional connections to the non-human world.

The final passage of the novel uses literary language to imagine humans as part of, and not separated from, the natural world and to evoke feelings of shared environments with non-humans. The text focuses on a character who, after taking the island's popular drug Luna, is feeling a "non-linguistic sense of all-encompassing connectedness"[95] (285). His perception of the ocean acknowledges the presence of the ocean as non-human Other in its own right and places the human back into the natural world:

> The young Kröcher looks out at the sea and does not perceive it in any way as dangerous or threatening or evil. It is the purest, most time-remote presence, proud presence, that which is right of itself, unbothered, all-mirror in the night, world of depth, part of the earth averted from light. The boy on the harbor wall feels the surging of gigantic kelp forests, impossibly wide and limitless, steaming funnels of undersea sulphur springs, shimmering shoals, kaleidoscopic coral constellations, it lives and sways and surges around him and he

[91] "Die Malediven zählen zu den besten Tauchgebieten der Erde." (123)
[92] "Was die Malediven berühmt gemacht hat, ist die einmalige Tierwelt unter Wasser." (124)
[93] "Hier bildet die Koralle den Grundstock des Lebens." (124)
[94] "… sie spüren jede für sich, dass das Verlesen dieser Totenliste der Vielen, die längst nicht mehr im Wasser um die Atolle entdeckt und beobachtet werden können, allen gleichermaßen den Magen umgedreht und die Fröhlichkeit ausgetrieben hat." (124)
[95] A "sprachfremdes Empfinden von allumfassender Verbundenheit" (285).

> feels himself, recognizes himself unmistakably: an insignificant scrap of life, but deeply satisfied. (286)[96]

Kröcher's awareness of his position within the maritime ecosystem is described as both a feeling and a coming to terms with the resistance of the non-human to acts of interpretation (i.e., the sea as dangerous or threatening or evil).

The novel's evocation of the fluidity and dynamism of water as escaping and refusing containment on a symbolic level are part of an "emerging postmodern awareness of the limitations of realist fiction's anthropocentric perspectives in the Anthropocene" (Johns-Putra, "The Rest Is Silence" 27). Although circling back to language and discourse risks losing sight of the extra-discursive reality of the non-human and forgetting that "nature [...] is not a cultural formation" (Soper 8), postmodern fiction has the potential to challenge anthropocentric thinking. *Malé* performs what Johns-Putra calls "the decentering of Anthropos and all its trappings" ("The Rest Is Silence" 40) and contributes to a "larger project to dislodge the kind of binaristic thinking, emanating from Western modernity, that the metanarratives of reality, anthropocentrism, and cultural domination have in common" ("The Rest Is Silence" 33).

V. Conclusion

This chapter focused on the ways in which cli-fi novels respond to the (in)ability of narrating non-human agencies and so illustrated another aspect of literature's 'response-ability' in a time of climate change. I analyzed three cli-fi novels, examining how they deploy different kinds

[96] "Der junge Köchert schaut aufs Meer hinaus und empfindet es auf keine Weise gefährlich oder bedrohlich oder böse. Es ist reinste, zeitferne Präsenz, stolze Gegenwart, das von sich aus Richtige, unbehelligt, Allspiegel der Nacht. Tiefenwelt, lichtabgewandter Teil der Erde. Der Junge auf der Hafenmauer fühlt das Wogen gigantischer Kelpwälder, unfassbar weit und ohne Grenzen, dampfende Schlote unterseeischer Schwefelquellen, schillernde Schwärme, kaleidoskopische Korallenkonstellationen, es lebt und schwankt und wogt um ihn herum und er spurt sich selbst, erkennt sich unmissverständlich ein unbedeutender Fetzen Leben, aber zutiefst zufrieden." (286)

of formal and narrative strategies to engage with and represent non-human agencies. Although *The Swarm* portrays non-human beings primarily through anthropocentric and scientific perspectives, it also challenges such thinking. At times, Schätzing breaks up the narrative structure to contrast the representation of the yrr as vengeful creatures with other, more experimental ways of imagining them. The text gradually shifts from human perspectives and humanity's struggle to come to terms with its threatened existence to a multi-scalar, underwater perspective that situates the yrr (and humans) in much longer time scales. Especially in the last part of the novel, entitled *Contact*, the yrr dominate the narrative and its form. In *Lamentations*, Trojanow uses problematic tropes, such as the glaciers as female lover figures, which leaves very little room for forms of agency not based on autonomy and individuality. Yet, Trojanow also experiments with a variety of voices that cannot be traced back to a single source, which briefly undermines the narrative arc in which the non-human is storied (but never matter).

While Schätzing's and Trojanow's narratives about the non-human world remain tied to elements of human drama and only briefly experiment with formal conventions, Ehrlich breaks with this structure by not allowing readers to locate the non-human within a linear trajectory or one single role. Instead, *Malé* exposes the challenges that arise when narrative logic is mapped onto the non-human world. By refusing this logic, the novel acknowledges that the non-human world can never fully be accessed through language and makes room for multiple ways of relating to the non-human within these constraints.

Building on these insights about the narrative challenges of storying non-human agency in a time of climate change, the next chapter examines the ways in which issues of the local and the global emerge in climate fiction. Some of these issues can already be seen in the present chapter: Schätzing's novel portrays both the vast scales of oceans around the world and microscopic views

of various organisms (i.e., worms, bacteria, particles etc.), while Trojanow's focus on melting glaciers and Ehrlich's depiction of rising sea levels both contribute to global climate change imaginaries. I will, however, be focussing on a different constellation of novels in order to best illustrate the permeability of the boundaries within which a sense of place emerges in the context of global crisis.

CHAPTER THREE

QUESTIONS OF SCALE:

ARTICULATING THE LOCAL AND THE GLOBAL

How does cli-fi imagine the global processes and vast planetary scales of the Anthropocene that alter our thinking about local places and the emotional bonds we form with these environments? How do cli-fi novels create their own sense of place embedded in discourses about climate change? In the context of this thesis, I focus on three cli-fi novels written in German to answer these questions. In this way, I am able to work through some specificities of cultural tropes about nature and global climate change imaginaries. But what is culturally specific to contemporary cli-fi written in German? My analysis seeks to show how each of the three novels deal with the global by situating their texts both within and beyond the boundaries of culture. My analysis will follow Erin James's approach to ecocritical reading, when she suggests a turn from "reading for environment — that is, for mimetic or realistic depictions of nature — to reading environmentally — that is, for evidence of the way a text's language and form encodes a construction of and subsequent interaction with that text's environment" (66).

Even if climate change is an environmental problem that needs to be addressed globally, the effects of climate change are experienced locally through the body. Moreover, calls for a return to the local to fight environmental harm caused by globalization have shaped cultural conceptions of ecological lifestyles. Situated between the local and the global, cli-fi texts face the challenge of imagining a crisis unfolding on multiple spatial scales. Where a story takes place becomes particularly important for the ways in which cli-fi texts situate themselves in relation to these scales because it determines the kinds of relationships to place that these texts create.

Notions of place and place attachments have always played a crucial role within ecocriticism. As Robert Kern points out, "all texts are at least potentially environmental […] in the sense that all texts are literally or imaginatively situated in a place, and in the sense that their authors, consciously or not, inscribe within them a certain relation to their place" (10). Through the connections between individual and local experiences of changing environments and the collectively experienced global effects of climate change, literary writing can bring about a multilayered sense of place. To this end, I propose a definition of place that contrasts with traditions of place-thinking within Romanticism (e.g., Wordsworth or Thoreau) where nature writing is anchored in a specific local environment. Instead, I focus on conceptions of place that emphasize its location within broader socially constructed as well as globally affected networks. In addition, I distinguish between place as a geographically framed location on the one hand, and a form of attachment on the other. Geography scholar Tim Cresswell defines place as "a way of seeing, knowing and understanding the world" (11). In contrast to place as a locality, such a description puts place in relationship to the body as a seen, felt and known experience.

To begin answering questions about spatial scales in climate fiction, this chapter adopts the threefold understanding of place as geographical location, setting for the formation of social relations, and site of emotional attachment (Agnew 27-8). To further nuance the notion of place, I draw from the work of Marxist geographer Doreen Massey, who defines place not as territorial or self-contained but as socially differentiated and in relation to the dynamic power structures of globalisation. She proposes an alternative interpretation of places, imagined "as articulated moments in networks of social relations and understandings," allowing "a sense of place which is extroverted, which includes a consciousness of its links with the wider world, which integrates in a positive way the global and the local" (Massey 67). Although Massey focuses on urban spaces,

her work is important because she defines place as a process that cannot be framed within specific boundaries and is always constructed in relation to something else as "a linkage *to* that 'outside' which is therefore itself part of what constitutes the place" (68, emphasis in the original). The boundaries within which a sense of place emerges are permeable and transcend territorial frames. Moreover, they cross lines of species identity so that a sense of place is no longer tied to the human sphere and the local, but something that is developed in relation to global contexts and the non-human. This requires a shift to "a biocentric view of the world," which allows us to "expand our understanding of the ways in which places are shaped to include not only human actants but non-human forces as well, such as climate patterns, geological forces and formations, and the transformations of ecosystems" (Filipova 17).[97]

Local experiences of environmental changes are interconnected on a global scale which shapes or challenges how we can form a sense of place. However, these connections occur on vast scales that are not part of our immediate experiences of the local. This tension between immediate local experiences and vast global scales alters the ways in which cli-fi texts imagine the role of humans in their environments. According to Eva Horn and Hannes Bergthaller, "what is at stake in the Anthropocene is above all the global agency of the human as anthropos. The space in which the human being is situated now is no longer that of a local environment, but that of the world as a whole" (6). Human agency can no longer be contained within local boundaries as it extends to the planet as a whole. Therefore, a sense of place is always already embedded within larger global structures and scales.[98] Cli-fi must contend with this issue of articulating new possible meanings

[97] Yet, as recent work on biocentrism emphasises (e.g., *Arts of Living on a Damaged Planet*, edited by Anna Tsing et. al.), tending to human and non-human entanglements and thinking in biocentric terms on large scales brings about its own limitations.

[98] There is a continuous interest in scale within ecocriticism, from Heise's *Sense of Place, Sense of Planet: The Environmental Imagination of the Global* (2008) to *Narratives of Scale in the Anthropocene* (2022), edited by Gabriele Dürbeck and Philip Hüpkes, from *The Bioregional Imagination: Literature, Ecology, and Place* (2012), edited by

of place and place attachment in relation to the whole planet. Although events caused by climate change can be localized within specific places, it is difficult to make sense of locally experienced events, such as shifting weather patterns, that are part of phenomena occurring on much larger scales. This requires an extended notion of place that responds to or engages with the planetary.

In this chapter, I will demonstrate that the three novels respond to issues of scale either by cultivating a global perspective on place in the reader or by focusing on the sense of place of individual characters. In *The Swarm*, Schätzing uses an omniscient perspective to link different geographical locations around the world and conveys a global perspective to the reader.

Because of its depiction of multiple locations on the globe through a gaze that is removed from the processes of developing a sense of place, *The Swarm* imagines place as global rather than planetary. There are moments where Schätzing experiments with a view that zooms in on maritime environments and the connections within the planetary ecosystem, which briefly shifts to a more planetary perspective that "is informed by principles of exchange, of connection, interaction, and synergy" (Horn and Bergthaller 11). However, the God's eye view that dominates the novel does not allow for cultivating this sense of the planet as a dynamic network because it remains limited to geopolitical understandings of the globe as a set of different locations. By mapping out the globe, naming specific places, and presenting a familiar geographical anchoring of place to the reader, the novel does not cultivate socio-historical understandings about events occurring in those places nor does it delve into personal memories of the different beings inhabiting them.

In *By the Sward/An der Grasnarbe* (2022), Mirjam Wittig develops a sense of place that originates from the relationship between individual characters and their environments and that emerges in relation to the forces that shape these environments. Instead of evoking a global

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Tom Lynch, Cheryll Glotfelty and Karla Armbruster to Timothy Morton's *Hyperobjects: Philosophy and Ecology after the End of the World* (2013).

perspective from an all-encompassing and "totalizing gaze" (Horn and Bergthaller 11) made up of multiple locations dominantly in the Global North, as is the case in *The Swarm*, Wittig's text imagines place in relation to global threats that impact the main character's sense of place, such as the fear of terrorism or extreme and unpredictable weather patterns. Moreover, the novel experiments with the lens of the pastoral, zooming in on the character's experience of the countryside in opposition to the city. Even if this literary genre is part of a European tradition of place thinking, Wittig's novel seems to use it to bypass the problematic socio-historical elements and memories attached to a specifically German sense of place, such as the exclusionary and violent blood and soil politics of the Nazi Regime. The novel focuses on the experiences of an individual character within a rural environment in France and on her struggle to develop a sense of place that is threatened not by traumatic experiences of specific historical ideologies, but by ongoing global forces, such as terrorism and climate change. It thus embeds new possible meanings of place within multiple interconnected forces and outside or alongside the frame of one particular culture.

In her novel *Winter's Garden/Winters Garten* (2015), Valerie Fritsch links place to a sense of loss in the face of a slowly unfolding apocalypse. She portrays characters whose memories are attached to rural places in opposition to the urban as an abstract space that resists these kinds of attachment. Without identifying specific geographical locations or naming the threat that hinders an attachment to the city, the novel outlines a sense of place through the characters' memories of a rural garden that used to be cultivated and populated but has since been abandoned. Whereas *The Swarm* glosses over specific senses of place and uses geography to zoom out to the global scale, *By The Sward* and *Winter's Garden* cultivate difference and subjectivity as individual characters

develop relations to places that resist feelings of attachment or require them to adjust to threatening forces on global scales.

I. From the Globe to the Deep Ocean: Imagining Scales in *The Swarm*

Feeling connected to the places in which we live is becoming increasingly challenging due to the anxiety we feel over rapid environmental decline caused by climate change. Our subjective and local sense of place is in tension with and ruptured by concerns for the planet as a whole. Responding to these challenges, *The Swarm* asks how our thinking about place is transformed and shaped in the face of the vast spatial scales of climate change. Schätzing depicts place as always embedded in the global and foregrounds concerns about the state of the planet and humanity as they complicate attachments to local and disappearing places. The geographical locations in the novel's first two parts follow a specific "centre-periphery logic" (Feindt and Dürbeck 215-17), starting in the Global South (i.e., the prologue is set on the Peruvian coast) and shifting to the Global North (i.e., scientists from multiple European countries working together at the *Chateau Disaster* in Whistler, Canada). Emphasizing a geo-political understanding of the globe, the novel primarily presents countries located in the Global North (i.e., Canada, Norway, Germany, and France) as representative of the globe as a whole and, therefore, privileges a Western perspective.

Furthermore, the text responds to issues regarding spatial scales that arise from such a global perspective by using an omniscient view. This narrative perspective brings together different scales that can be localized or traced back to specific points on a map. In its attempt to imagine the globe in its entirety, this perspective is "able to take in the entire planet at one glance and perceive it as a shared whole without conflicting histories or cultures," "rel[ying] on the intervention of advanced technology" (Heise, *Sense of Place* 37). Although this perspective imagines global connectedness as a whole, it risks erasing the cultural heterogeneity of the parts

that make up this whole. Imagining environmental disasters at this global scale primarily through the lens of science, the novel adheres to the notion of global climate change that "decimates and invades collective identities forged by history, class, gender, race and caste," and "redraws a map of the earth, at least a rhetorical map, as a single space occupied by all inhabitants" (Doyle and Chaturvedi 520).

Such a critique of global scale in the novel requires, however, some nuance as there are brief explorations of a relational sense of place within maritime environments. The text moves from a geographically anchored conception of place to a constellation and network of multiple places, including the ocean, that rupture territorial and species boundaries. Tracing the story's progression from land to sea reveals the ways in which the text experiments with an ocean-centred approach to place, one that contrasts an anthropocentric, Western depiction of the global. While specific geographical locations anchor the multiple narrative threads, the existence of the yrr, a species living in the ocean, complicates human-centred ideas of place. Their perception of environments and their way of situating themselves in relation to the planet illustrates how we might learn from non-human perspectives.

To cultivate a sense of the entire globe, the novel's narrative perspective zooms in and out of multiple locations and alternates between different scales. The prologue specifically addresses the impossibility of forming a local sense of place cut off from the influence of the global. The story of Juan Narciso Ucañan, a Peruvian fisherman whose region has been exploited by global capitalism and who becomes the first victim of the yrr, serves as an example of the devastating effects of globalization on local populations and maritime environments as they are exploited for profit. Described as a person whom "the new millennium had decided to pick on" (4), Ucañan's attachment to his home is threatened by the global processes at play in his native village,

Huanchaco. His story problematizes the idea of regionalism in the face of global capitalism and demonstrates how multi-national industries, such as tourism or fishing, shape local living conditions.

The novel also experiments with a multi-scalar view of the world, ranging from the microscopic view of bacteria to the view of Earth from space. By combining moments of zooming way up (i.e., space satellites) and zooming way down (i.e., the ocean floor), the text gives readers access to scales that are only accessible through technologies and scientific knowledge. For example, one of the passages describes piano sounds being "carried through the corridors on the ninth floor of Chateau Whistler," floating "out of the half-open window into the outside air" (424) and ending at "the altitude of 35,888 kilometres" where "Mozart was nowhere to be heard" (426). Over several pages, the narrative follows the piano sounds as they travel through the different layers of the Earth's atmosphere. Such a perspective frames the global using scientific terminology and disconnects place from individual and collective memories. Because the planet cannot be experienced as a whole, the text relies on science (i.e., using terms like *stratosphere* or *polar aurorae*) and a technologically mediated perspective (i.e., through satellites) to convey the vastness of the globe. It is not until the end of the novel, in the aftermath of the sinking of the *MS Independence*, that the text begins to develop an alternative scalar perspective. By focusing on the deep ocean, it acknowledges the existence of an environment that resists and challenges human practices of mapping, locating, and scaling. Imagining the experience of being immersed within a watery space as opposed to looking at locations on land from afar, the text moves from a global and distant gaze to a narrative style that tries to capture the vast scales of the ocean.

Blue ecocriticism, an umbrella term for ocean-centred approaches that critique ecocriticism's "land-leaning exceptionalism" (Dobrin 4), will serve as a lens to examine

Schätzing's attempt to describe the deep sea as a dynamic and fluid environment inhabited by non-human species. Scholars within blue ecocriticism call for a reconfigured sense of place, as ecocritic Sidney Dobrin explains:

> …an emerging blue ecocriticism would be limited by adhering to and attributing an idea of a sense of place that was formulated as a land-based way of knowing to ocean space and place and superimposed onto ocean or applied as default without considering the ramifications of such transference. (62)

Because water plays such a prominent role in the environmental crisis (i.e., rising sea levels; CO2 emissions causing ocean acidification), such expanded ecocritical approaches to place thinking are crucial. The increasing presence of water in *The Swarm* embeds humans within "matters oceanic" (Dobrin 7) that require a different logic. The novel can be considered ocean literature or literature of the sea in so far as it is about human interactions with the ocean. Moreover, the novel's final chapter progresses towards a depiction of the ocean in its own right beyond the human scale (as already discussed in my analysis of Karen Weaver's encounter with the yrr in the previous chapter).

At first, the novel predominantly presents the ocean in anthropocentric terms as a resource (i.e., site of oil drilling or fishing), tourist attraction (i.e., whale watching), research object (i.e., the work of marine biologist Leon Anawak) and mysterious unfathomable threat (i.e., the yrr attacking humanity from the depth of the ocean). Yet, the human-ocean relationship takes on new forms in the aftermath of the global disasters caused by the yrr (i.e., tsunamis or the collapse of the northern slope described as "the apocalypse" 355). On board the aircraft carrier *MS Independence*, members of the task force work in an environment not marked by national borders. Choosing the setting of a ship is a common strategy to navigate and imagine oceanic spaces, as DeLoughrey remarks in her discussion of artistic representations of the ocean: "the fluidity of the sea poses a challenge to the ability to render it into embodied and fixed place, so authors and artists

necessarily employ certain localizing figures such as the boat (or ship), the shore (or beach), and the body, human or otherwise" (135). The new location on board the *MS Independence* functions as such a localizing figure to orient the reader by containing the fluidity of the ocean within the boundaries of the ship and locating place in relation to the ocean as being *on* as opposed to immersed *within* the ocean. This illustrates how the text applies "land-based logics and languages" (Dobrin 59) to oceanic environments.

When the yrr cause the ship to sink, the narrative shifts from locating one's position *on* the oceanic map to experimenting with one's place *within* maritime environments.[99] The sinking is a crucial moment in the novel because locations on land disappear completely and geopolitical notions of place as location do not apply anymore. Imagining place in relation to the deep ocean, a fluid and everchanging non-human environment, the text situates the human species within the larger planetary ecosystem. Immersed within the deep sea, Weaver's land-based and anthropocentric logic fails, and the changed conditions of the ocean force her to adopt a new sense of place. Although her experiences are technologically mediated (she is inside a submersible), she begins to develop an individual relationship to the deep sea below the ocean's surface. Floating in the water and surrounded by "perfect darkness" (846), she is immersed in a deep-sea environment that is unfamiliar and extremely hostile as her survival depends on technological systems. The text emphasizes this unfamiliarity by gradually narrowing its view from the ocean surface to the deeper

[99] Moreover, the line between ocean and non-ocean is slowly erased by environmental disasters (i.e., tsunamis), which is visible in the text's form as specific geographical locations are replaced by broader reference points (i.e., the shelf or the coast) and abstract ideas (i.e., the subheadings *dreams*, *collective*, or *ghosts* in the novel's last part entitled *Contact*). Although the text names the Greenland Sea as the ship's location, it starts to experiment with imagining place in more fluid terms as the yrr, aggregated as "billions of amoebas" (815), flood the ship and, taking the shape of an organism with feelers and tentacles, enter the bodies of the humans they encounter. In this scenario, everything becomes a watery space and even bodies no longer function as a boundary between human and non-human.

parts of the ocean, situating Weaver's experience of moving downwards within larger planetary scales:

> Polar waters are blue. In the Arctic, the north Pacific and parts of the Antarctic, there isn't enough chlorophyll-containing life to colour the water green. A few metres below the surface, the blue takes on the aspect of a sky. Just as an astronaut in a spaceship sees the familiar sky darken as he travels away from the Earth until the blackness of outer space engulfs him, so the submersible travels in the opposite direction through an inner space, the unknown reaches of a lightless universe. Up or down, the direction makes no difference: in either case, the passing of familiar landscapes is accompanied by a loss of familiar perceptions, of the feelings derived from human senses – of sight, and then gravity. (846-847)

Gradually, the text stops theorizing or accessing the ocean through scientific knowledge, acknowledging the limitations of these strategies, and sitting with a sense of no place that the ocean cultivates in humans.

Not being able to rely on her senses to orient herself, differentiating between ocean and non-ocean becomes difficult for Weaver. This sense of disorientation is reflected in the text's form as it becomes unclear who or what is speaking from where and to whom. The shift to a narrative perspective that cannot be traced to Weaver but addresses her or the reader as a particle seems to mimic the ocean's constant flow, experimenting with an oceanic stream of consciousness as a way of writing from the perspective of an Other:

> You're a powerful current, you and the other particles, and near the coast of Newfoundland you're joined by water from the Labrador Sea. It isn't as cold or as heavy as you are. You continue towards Bermuda, and circular UFOs spin across the ocean to meet you, warm, salty Mediterranean eddies from the Strait of Gibraltar. The Greenland Sea, the Labrador Sea, the Mediterranean — all the waters mingle, and you push southwards, flowing through the depths. You watch as the Earth brings itself into being. (851)

Human-centred perspectives dissolve literally as Weaver can only partly see her surroundings and metaphorically as the text narrates a single particle's journey through time and space, mimicking the non-linearity and dynamics of the ocean as an interconnected ecosystem.

The novel uses additional techniques to challenge anthropocentric thinking about a sense of place. Although science provides knowledge about the ocean ("The oceans were full of dents, humps, bulges and troughs. For a long time, scientists had assumed that the water in them was spread evenly across the globe, but the map offered a different picture," 450), this perspective is contrasted with another way of 'mapping' the ocean when the yrr 'communicate' with the scientists on board the *MS Independence*. Entitled "The Big Picture," the scene in which the scientists realize that one of the yrr's messages contains an image of the Earth's magnetic fields that shows the planet's geological past illustrates how the text juxtaposes anthropocentric thinking about place with other-than-human ways of scaling the world:

> "At first, we didn't know what they'd sent us, but once we realised it was a map of the world it all fell into place. It's actually quite straightforward. They used water as the baseline for the message and paired each water molecule with geographical data." "But how would they know what the Earth looked like all that time ago?" Vanderbilt said. "They remember it," said Johanson. "But no one can remember the prehistoric era. Only single-cell organisms." Vanderbilt broke off. "Exactly," said Johanson. "Only single-cell organisms and the first multicellular life-forms. Last night the final piece of the jigsaw fell into place. The yrr have hypermutating DNA. Let's say they gained consciousness at the beginning of the Jurassic era. That's two hundred million years ago, and they've been storing knowledge ever since." (754)

This new planetary scale from the perspective of the yrr emerges from an other-than-human perspective as the yrr acquire knowledge about the environments they inhabit by storing knowledge in their DNA. This is a sense of place that develops in relation to time and memory that go well beyond the possibilities of any one human individual's genetic make-up. It is a collective, embodied, shared, generational sense of place-time on planetary scales.

II. The Pastoral Reconfigured and Embodied Sense of Place in *By The Sward*

Rather than revolving around catastrophic, planetary crisis as is the case in *The Swarm*, Mirjam Wittig's novel *An der Grasnarbe*/*By The Sward* (2022, not yet translated into English)[100] is concerned with the psychological states induced in individuals, when their bodies and landscapes are externally threatened. Narrated in the first person, *By The Sward* imagines an individual's struggle to form a sense of place in relation to her fear of global threats, such as terrorism and climate change. The main character, Noa, leaves the city, where she suffered from panic attacks and a heightened sense of fear, to work as a volunteer on a farm in Southern France. There, she is soon confronted with the reality of global warming that challenges her idealized notion of the countryside as a place of stability and harmony. Although *By The Sward* does not address environmental issues as directly as *The Swarm*, Noa's experiences at the sheep farm and the relationship she forms with the rural are impacted by the effects of the climate crisis. Expanding her sense of fear from urban to rural environments, Noa's observations of rivers drying up and of the devastating effects of floods, are moments where she encounters climate change as a threat to her sense of place.[101] In addition to depicting an increasingly climate-changed countryside, Noa's anxiety regarding potential terrorist attacks manifests in her body, another way the novel embeds the local within the global.

Although the novel is not set in Germany, it is written in German, published in Germany, and circulates primarily within German-speaking audiences. For the purpose of my analysis, I will situate it within a German environmental imagination that interrogates the formation of place

[100] All English quotes from the novel in this chapter are my translations, with the German original in the footnotes.
[101] The novel imagines threats in a way that fits within Ulrich Beck's terminology to describe the current era of modern society as "risk society," defined by "a range of new risks – for example, environmental problems – which are unintended side effects of technological development" (Arnoldi 46). For Beck, risks are caused by humans and manufactured, whereas dangers are caused by nature. Noa faces two of the risks that Beck lists in his work, namely ecological and terrorist risks.

attachments. Setting the novel in France instead of Germany, Wittig partially gets around the problem of engaging with exclusionary politics of place and National Socialist claims on connections to the land. The novel thus becomes an example of cli-fi written in German that offers an alternative sense of place, one that is anchored in the inner thought processes of a character and embedded in the pastoral. In many ways, Wittig's use of this trope can be seen as a response to Germany's ideological understanding of belonging based on patriotic notions instrumentalized by National Socialism, such as *Heimat* or *Vaterland* (both specifically German terms associated with describing one's native land).[102]

Engaging with different kinds of anxieties that emerge in the face of global threats, the text intersperses Noa's experiences of her life on the farm with flashbacks of city life, such as overcrowded metro stations. As the novel imagines the rural and the urban through Noa's eyes, it takes up elements of the pastoral, for example, by associating urban environments with threats in contrast to the rural as a presumably calm and harmonious place. However, the text interrogates these pastoral ideas, asking how this literary tradition can be modified in light of the fact that the countryside is no longer a site of stability and is affected by global risks, such as climate change. The text creates parallels between signs of environmental decline and Noa's visceral responses to terrorism. Unlike *The Swarm*, a text that adopts a global perspective, Wittig's novel invites the reader to reflect on the different kinds of menaces that alter the conditions in the environments we inhabit, potentially forcing us to move or preventing us from forming bonds with environments that have become increasingly hostile.

[102] Here, the image of the scar, evoked by the compound word *Grasnarbe/'grass-scar'* in the German title, points to the historical complexities of place and the trauma surrounding the connections between racial politics and feelings of connection to the land.

Set on a sheep farm in France, the story describes the countryside as a climate-changed place and so requires the lens of a reconfigured 21st-century pastoral. First, the novel does engage and experiment with strands of the classic pastoral, namely as "literary convention, literature of the countryside, […] and the landscape of herding animals" (Gifford, *Pastoral* 167). Used as an epigraph, excerpts from Virgil's *Eclogues*, considered a foundational text for pastoral and bucolic poetry, link the novel to the pastoral as a literary tradition. This reference also points to the text's bucolic theme and frames Noa's story as a text that can be situated within or alongside this literary tradition. Focused on Noa's experiences as a shepherd on a farm, the text's first-person narrative can be considered literature of the countryside. Moreover, Noa describes seeing the valley for the first time in scenic terms, from above: "Wet indeed, streaked with bright clouds, cross-hatched, half-hidden, but the scattered houses were made of stone and old, and the trees were all green despite the winter, as if time were sorted differently here" (21-22).[103] As Noa becomes more familiar with this landscape, her view expands, allowing her to see it through "another line of sight […] revealing new valleys" (34).[104]

> On the *crête*, the strength of the wind surprised me. I hadn't been up there for several weeks, and I hadn't felt any of it on the trail. Here it tore at the broom bushes. I had heard a few sheep bells, but from a direction from which they could not really come. The wind made the few sounds difficult to locate. For quite a while I just stood in the sun and looked, I had several hours to myself, at my disposal. I drank from Ella's bottle and found everything incredibly beautiful. […] The broom bushes were full of yellow blossoms. (112)[105]

[103] "Nass zwar, von hellen Wolken durchzogen, anschraffiert, halb verborgen, aber die vereinzelt stehenden Häuser waren aus Stein und alt, und die Bäume standen trotz des Winters ganz grün, als wäre die Zeit anders sortiert. (21-22)
[104] Oben war endlich eune andere Blickrichtung möglich, die eine Reihe neuer Täler offenbarte. (34)
[105] Auf dem crête überraschte mich die Stärke des Windes. Ich war mehrere Wochen nicht oben gewesen, und auf dem Weg hatte ich nichts davon gespürt. Hier riss er an den Ginsterbüschen. Ein paar Schafsglocken hatte ich gehört, aber au seiner Richtung, aus der sie eigentlich nicht kommen konnten. Durch den Wind waren die wenigen Geräusche schwer zu verorten, er vereinnahmte sie. Eine ganze Weile stand ich nur in der Sonne und schaute, ich hatte mehrere Stunden am Stück für mich allein, in meiner alleinigen Gewalt. Ich trank aus Ellas Flasche und fand alles unfassbar schön. […] Die Ginsterbüsche standen voller gelber Blüten." (112)

Rather than looking down at the valley from the peak, Noa describes her immediate surroundings through her senses and relates to place through the wind on her skin and the vegetation that surrounds her. On hikes, her gaze has "so much space everywhere" making her think that she "could lay [herself] over the air that filled the hollow between the mountains, spread out over it like a blanket" (113).[106]

Urban spaces, on the contrary, are depicted as crowded with "streams of people walking the concourse after work, hundreds of homeward journeys, commuting footfall to the trains for neighbouring town or the banlieues" (1).[107] Furthermore, the city is linked to terrorism when Noa remembers "the footage from Brussels airport," which alludes to the terrorist attacks that happened in Brussels in 2016. A few pages earlier, in the prologue, the novel describes Noa's intense fear of possible terrorist attacks:

> If I close my eyes for a moment, there, beyond my blinking, I can see another one blow himself up, see my own self tucked under a seat. I watch the explosion, my head pulled in, feel the shock wave, hear it, see someone make a sign and press something, make a sign and shout something, and then everything is torn to smithereens. I open my eyes. As if I had any idea what a blast does to a body. (2)[108]

Trying to distract herself from these horror scenarios, she focuses on her breathing and observes what is happening around her. At a later point in the text, she thinks about the meaning of a newly learned expression in French, *écorché vif*, to describe "a person who is irritable, anxious, and

[106] "Mein Blick hatte überall so viel Platz. […] Ich meinte, mich über die Luft, die die Senke zwischen den Bergen füllte, mich darüber ausbreiten zu können wie eine Decke. (113)
[107] …in der Halle laufen die Menschen in Feierabendströmen, hunderte Nachhausewege, Pendelschritte in die Bahn, in die Nachbarstädte oder die Banlieues." (1)
[108] "Wenn ich die Augen einen Moment über das Blinzeln hinaus schließe, sehe ich wieder einen, sehe ihn in die Luft gehen, mic hunter einen Sitz klappen, sehe ich die Explosion, den Kopf eingezogen, fühle die Druckwelle, höre, sehe, wie einer ein Zeichen und dann etwas drückt, ein Zeichen macht und etwas schreit, und dann ist alles zerfetzt. Ich öffne die Augen. Als ob ich wüsste, was eine Druckwelle mit dem Körper macht." (2)

tense" and "is said to have the sensibility of one who has been skinned alive" (144).[109] The term aptly describes the kind of vulnerability and fear that Noa experiences in the urban setting described above. But such a straightforward reading of the novel's classic pastoralism is challenged by the fact that Noa continues to feel threatened even after leaving the city and settling into her rural setting. For example, shortly after her arrival on the farm, Noa starts to notice the inconsistency of weather patterns disrupting seasonal farming routines:

> It stormed so hard that the cedar bent right up to the kitchen window, and after a few minutes we stopped planting and turned to housework for safety - not without first spending a few minutes looking out over the valley from the cellar entrance, Gregor with a deeply furrowed brow: *It doesn't storm here in March*. Nobody knew what storm in March meant, how such signs were to be interpreted at all. I took note of them helplessly, Gregor and Ella were worried about them. But even they could not get beyond a general *everything is already in disorder*. (25; emphasis in the original)[110]

Extreme and unpredictable weather destabilizes the conditions of living in the country. Noa's initial reason for moving to the sheep farm, getting away from urban chaos, suggests that she subscribed to a pastoral conception of nature, that is, "the spatial distinction of town (frenetic, corrupt, impersonal) and country (peaceful, abundant)" (Garrard 39). Although leaving the city mitigates Noa's panic attacks to some extent, she becomes aware of the destabilizing effects of the climate crisis that create a sense of fear of this unpredictable and invisible enemy.

As readers gain access to Noa's experiences of 21st-century country living, they are challenged to reconsider their ideas of the country as an idyll. In this sense, *By The Sward* is an

[109] "Von einer gereizten, ängstlichen und angespannten Person, sagt man im Französischen, sie habe die Empfindsamkeit eines am lebendigen Leibe Enthäuteten." (144)

[110] "Es stürmte so stark, dass die Zeder sich bis vors Küchenfenster beugte und wir nach wenigen Minuten das Pflanzen abgebrochen und uns zur Sicherheit auf Hausarbeit verlegt hatten – nicht ohne vorher einige Minuten vom Kellereingang aus über das Tal zu schauen, Gregor mit tief gefurchter Stirn*: Im März stürmt es hier nicht*. Niemand wusste, was Sturm im März bedeutete, wie solche Zeichen überhaupt zu deuten waren. Ich nahm sie ratlos zur Kenntnis, Gregor und Ella bereiteten sie Sorge. Aber über ein allgemeines *Alles ist bereits durcheinander* kamen auch sie nicht hunaus." (25)

example of Terry Gifford's "post-pastoral"[111] because it asks how the trope of the pastoral needs to change so that literature can provide meaningful engagements with or imagine 'the countryside' in relation to the global. That is not to say that 'post' always needs to refer to the ways in which the pastoral has evolved over time, but it can instead point to ways of reconfiguring the pastoral as multiple strands of writing that go beyond their conventional use. Noa understands the hardships of cultivating the land and caring for the sheep that become increasingly difficult due to radically changing environmental conditions. Such a reality challenges romanticized ideas of the natural world in harmony, free from the forces of modernity at play in the city. Moreover, the text holds together the tension between the destabilizing effects of changing weather patterns and Noa's desire to develop feelings of attachment to and find peace in her countryside setting. For instance, she notices on a bike ride that "the river below made a dry sound" and acknowledges that "it should have been raining urgently for several weeks" but continues to describe the lush colours of the trees that "did not yet display any signs of this lack" (61).[112] To further understand the novel's movement through and with the literary tradition of the pastoral, it is necessary to look more closely at how Noa cultivates an embodied sense of place.

Indeed, *By The Sward* uses the pastoral as a framework to examine the role of the body in developing a sense of place. Noa reconnects and opens up to 'nature' by coming back to her body's pleasures, a way of coping with her fears when she spends time alone in the forest:

> I felt it just running over my body. I slid a little lower until I was lying more comfortably, and in the process, the shirt rolled up so that I could feel the fern and the ground beneath me. I also slipped my left hand under the waistband of my pants, dipping my fingers into this liquid space of my own. After a few seconds I opened my eyes to look at the mountains

[111] Gifford describes the post-pastoral as "'reaching beyond' the limitations of pastoral while being recognizably in the pastoral tradition" (Gifford, "Pastoral, Anti-Pastoral, and Post-Pastoral" 26).

[112] "Der Fluss unten machte ein trockenes Geräusch, ein Rascheln, ich hätte ihn nur sehen können, wenn ich mit gerecktem Kopf sehr nah an das Mäuerchen am Straßenrand herangefahren wäre, aber ich wusste auch so, dass es schon seit mehreren Wochen dringen hätte regnen müssen." (61)

> across from me. I pulled the pants further open and a whole bit down, there was only my skin, exposed, right in the air. I wanted to perceive it fully: that I was lying outside, that I could be discovered from anywhere, the situation open, but that there was simply no one there and I was absolutely safe. Everything lay unrolled around me, the green and vast and little stings in my back, from stones or dead wood. My fingers didn't speed up, it hardly took any pressure. Hardly any movement of the hip needed for the shivers, the pulses, for the center of warmth, for: it. (115)[113]

Noa becomes aware of her embodied existence as intimately imbricated in the forest environment.[114] Although the rural environment helps Noa to find moments of relief from the tension she holds in her body, she is also constantly reminded that her body carries traces of other urban places. During her daily tasks at the farm, she continues to have flashbacks of panic attacks that occurred in the city. For example, when she first helps herd the sheep into a pen, the "the image of the sheep that could not breathe and was gasping because it was pressed against the bars" (45)[115] reminds her of feeling overwhelmed and experiencing difficulty breathing in a metro shaft surrounded by people. The fact that Noa's body does not allow her to fully escape the city highlights the importance of the body as a site for the self to develop a sense of place. As scholar Edward Casey explains, "the self has to do with the agency and identity of the geographical subject; body is what links this self to lived place in its sensible and perceptible features" (Casey 683). By placing scenes of sheep herding in parallel with urban scenes of metro stations and crowds

[113] "Es lief ganz einfach über meinen Körper. Ich rutschte ein Stück tiefer, bis ich bequemer lag, dabei rollte sich das Shirt auf, sodas ich den Farn und den Boden unter mir spürte. Ich schob die linke Hand unter den Hosenbund, tauchte die Finger in diesen meinen eigenen verflüssigten Raum. . Nach ein paar Sekunden öffnete ich die Augen, um die Berge mir gegenüber anzusehen. Ich zog die Hose weiter auf und ein ganzen Stück nach unten, da war nur meine Haut, bloßgelegt, direkt an der Luft. Ich wollte das ganz wahrnehmen: dass ich draußen lag, dass man mich von überall aus entdecken konnte, die Situation offen, aber dass da einfach niemand war und ich absolut sicher. Alles lag um mich ausgerollt, das Grüne und Weite und kleine Stiche in meinem Rücken, von Steinen oder totem Holz. Mein Finger wurden nicht schneller, es brauchte kaum Druck. Kaum Bewegung der Hüfte für die Schauer, die Pulse, für den Mittelpunkt der Wärme, für: das." (115)

[114] The forest marks a third type of place: a largely uncultivated environment compared to the city and the countryside.

[115] "…das Bild des Schafs, das keine Luft bekam und röchelte, weil es Gegen die Gatterstäbe gedrückt wurde." (45)

of city dwellers, the novel holds multiple conceptions of environments together linked through the body.

To further understand the role of the body, it is helpful to consider the novel's title. In English, the term, *sward*, refers to "the upper layer of soil usually covered with grass or weeds" (Canadian Oxford Dictionary). Combining the image of something that is considered part of nature (soil or grass) with the idea of covering or layering points to Noa's work on the farm and, metaphorically, to the process of healing and recovering from her panic attacks. In this regard, the original German title *An der Grasnarbe* bears an important additional connotation because *sward* translates to a compound word that combines the words *grass* and *scar*. Describing a covering of grass while at the same time meaning a "permanent mark on the skin left after the healing of a wound, burn, or sore," "the lasting effect of grief, suffering, etc. on a person's character or disposition" or "a mark left on the stem etc. of a plant by the fall of a leaf etc." (Canadian Oxford Dictionary), the German title strongly alludes to a human-nature relationship that takes place within the inner landscapes of Noa (the traces of her fear as scars) and the outer landscapes of the material environments affected by climate change. In addition, the text imagines Noa's body as a site of place attachment and a space in-between the local and the global, which brings environmental crisis and embodiment in relation to each other and echoes Stacy Alaimo's concept of *transcorporeality* to describe "the extent to which the substance of the human is ultimately inseparable from 'the environment'" (*Bodily Natures* 2). *Grasnarbe/grass-scar* and Noa's awareness of her embodiment within the local environment when she remarks that "the dirt belonged to my fingers by now as the little scratches belonged to my arms" and "such hands and arms made me a part of this region" (104)[116] point to this connection between bodies and physical

[116] "Solche Hände und Arme machten mich zu einem Teil dieser Gegend." (104)

environments. A concrete example of this connection can be found when the text describes Noa's emotional response to signs of environmental decline: "Watering where the watering hoses no longer worked. The ground was dusty. How it was painful: these few patches where the earth took on the healthy dark color, and how these then stood out from the dried-out ones" (106).[117] This scene evokes the image of the Earth in pain and suggests that Noa's body, bearing the scars of mental stress and the marks of working the soil, allows her to relate to other non-human kinds of suffering. The text more generally creates parallels between Noa's anxious body and the rural environment damaged by climate change, suggesting "the mutual vulnerability of both planet and people" (Alaimo, *Trans-corporeal feminisms* 23).

By pointing to the ways in which well-known pastoral tropes no longer apply within a climate-changed world, the novel is part of the post-pastoral as a way of "outflanking, transcending the pejorative pastoral of false idealisation and retreat from engagement with the complexities of the present" (Gifford, *Pastoral* 199). Wittig's novel contributes to the post-pastoral imagination by opening up a literary space where the divisions between rural and urban settings dissolve and the body functions as a site of place-making. The novel's epilogue, in particular, illustrates Noa's immersion into the environment as she participates in the movement of transhumance:

> Moving up, up the mountains along the sward, as if we were weather. Haze still hung over the animals that had eaten their way far down the slope during the night. As if they themselves were the valley, everything there lay in shadow, still bluish. The sun was already reaching me. I rolled up the sleeping bag and listened to the few sounds that were there. Not far from me cicada legs clanked. These days, there are cicadas even in the Alps, someone told me during the rest, ten years ago it wasn't like that. (189)[118]

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[117] "Gießen, wo die Bewässerungsschläuche nicht mehr funktionierten. Der Boden staubte. Wie weh das tat: diese wenigen Punkte, an denen die Erde die gesunde dunkle Färbung annahm , und wie diese sich dann von der wüsten abhoben." (106)

[118] "Hinaufziehen, die Berge hoch entlang der Grasnarbe, als wären wir Wetter. Über den Tieren, die sich in der Nacht weit den Hang hinab gefressen hatten, hing noch Dunst. Als wären sie selbst das Tal, lag dort alles im Schatten, noch bläulich. Mich erreichte die Sonne schon. Ich rollte den Schlafsack ein und hörte auf die wenigen Geräusche, die es

Compared to Noa's early descriptions of the landscape viewed from above and with clear distinctions between valleys and mountains, this passage describes the rural landscape as dynamic and fluid where the boundaries between bodies, environments, and meteorological phenomena fall away.

Reading this passage through the notion of "weathering," offers a productive framework to interpret the novel's ending. In their article, "Weathering: Climate Change and the 'Thick Time' of Transcorporeality," Astrida Neimanis and Rachel Loewen Walker explain how climate change and human bodies participate in "a common space, a conjoined time, a mutual worlding" (560), which further allows us "to understand that the weather and the climate are not phenomena 'in' which we live at all […] but are rather of us, in us, through us" (559). In the end, Noa recognizes that the body shapes and is shaped by the environment. In the novel's final scene, the description of the herd further illustrates how the body's connection to place requires an interconnected, entangled sense of multi-species becoming:

> With their fur, the sheep connected different habitats with each other. I imagined how, with each of their steps, it rained thorns, cell fragments, insects and seeds onto the earth, which had at some point gotten into the wool of the animals in another place or at another altitude. They absorbed everything and carried it with them until it fell off by itself or someone made a cut: when shearing, a biotope falls to the ground with the wool. (190)[119]

gab. Unweit von mir klirrten Zikadenbeine. Inzwischen gab es sogar in den Alpen Zikaden, das hatte mir bei einer Rast jemand erzählt, vor zehn Jahren sei das noch anders gewesen." (189)

[119] "Mit ihrem Fell vernetzten die Schafe verschiedene Lebensräume. Ich stellte mir vor, wie es bei jedem der mühsamen Tritte Dornen, Zellfetzen, Insekten und Samen auf die Erde regnete, die den Tieren irgendwann an einem anderen Ort oder in anderer Höhe in die Wolle greaten waren. Sie nahmen alles auf und trugen es so lang mit sich, bis es von selbst abfiel oder jemand einen Schnitt machte: Beim Scheren fällt mit der Wolle ein Biotop zu Boden." (190)

The emphasis on the intimate relationship between places and bodies nevertheless reminds the reader that Noa's body never forgets the sense of fear that emanates from threats of an unknown other (i.e., terrorists or unpredictable weather patterns).

The novel's final sentence – Noa looking "back along the stream of animal bodies, behind which no one came, down the wide slope" (190)[120] – does not offer any closure or resolution and suggests that being on the move and developing a nomadic rather than fixed or local sense of place is part of the climate-changed reality in which many humans already live. Compared to cli-fi novels that project such movement in the future, *By The Sward* seems to be set in the present, close to the now. It imagines climate change as an unresolved and continuous problem as a response to the issue that narrative closure "will always risk being evasive" (Clark, *Ecocriticism* 178). Any sense of place thus becomes both temporary and sporadic, embodied and embedded. As humans are forced to move around more and more in search of habitable environments, they carry more and more scars from their senses of place.

III. Awaiting the End of the World: Sense of Place & Memory in *Winter's Garden*

Whereas Wittig reimagines a sense of place in relation to rural farming, scarred bodies and global environmental change, *Winters Garten*/*Winter's Garden* (2015, not yet translated into English)[121] narrates the garden and the city through the trope of the apocalypse and the lens of memory. The main character's experiences in these environments and how they shape his sense of place from childhood to adulthood structure the novel on many spatial scales. The memories of Anton Winter, who grew up in a community living outside the city in a farmhouse surrounded by

[120] "Ich sah den Strom der Tierleiber entlang zurück, hinter denen niemand mehr kam, den weiten Hang abwärts." (190)
[121] All English quotes from the novel in this chapter are my translations, with the German original in the footnotes.

a lush garden, referred to as the "Gartenkolonie"/"Garden Colony," contrast with his life as an adult in a dystopian city "so noisy and strange, overeaten with tumult" (47).[122] Anton later moves to a nearby seaside city as an adult, where he lives in a glassed-in cube on the roof of a high-rise building and breeds birds. When the story shifts from Anton's childhood memories of the garden to the city, the world is suddenly in chaos.[123] The city conveys a doomsday atmosphere with zoo animals roaming the streets, people committing suicide in despair, and no electricity or water. In this doomed city, Anton meets Friederike, and they experience an intense romance. In the face of impending doom, Anton returns to the garden of his youth, and the world comes to a fiery end. Similar to pastoral depictions of 'the country' as a place of solace separate from 'the city,', the novel imagines this garden in contrast to urban decay and apocalyptic scenes[124] described as "deathly ill" (66).[125]

The novel also situates itself with respect to a German cultural context through its depiction of a *Kleingartenkolonie* or allotment garden, which takes on a specific role in the German human-nature relationship. According to Bigell, "one of the main attractions of allotment gardens is that they create a sense of place, of 'Heimat' because they are created by involvement and work in community and nature" (119). For Bigell, allotment and community gardens are "elements of the urban commons" and "part of the urban fabric" (102). This is an interesting aspect to consider for the German cultural context and an analysis of place in *Winter's Garden* because it locates gardens

[122] "So laut und eigenartig, überfressen an Tumult." (47)
[123] The juxtaposition of nostalgic scenes from the past in the garden colony and the hostility of the city in the present illustrates how the novel weaves in elements of the classic pastoral, namely "the spatial distinction of town (frenetic, corrupt, impersonal) and country (peaceful, abundant), and the temporal distinction of past (idyllic) and present ('fallen')" (Garrard 39). Yet, as my analysis of the novel's ending will demonstrate, the text breaks with this distinction and experiments with a post-apocalyptic aesthetic that is not finite but circular.
[124] According to Gifford, one of the qualities of the post-pastoral is the "recognition of a creative-destructive universe equally in balance in a continuous momentum of birth and death, death and rebirth, growth and decay, ecstasy and dissolution" (*Pastoral* 175). Death and decay, birth and growth are present throughout Fritsch's novel and give rise to such a post-pastoral sense of place as layers of sedimented memory .
[125] "das todkranke Land" (66)

within urban spaces rather than in opposition to them. Although the garden colony in the novel is located in relatively close proximity to the city, the text clearly imagines it as a separate and contrasting non-urban environment. While there is a geographical closeness between the garden and the city, the text sets them up as opposites in an imaginary that reconfirms a nature/culture binary. In this sense, the novel cultivates more a European literary tradition of the pastoral than the German socio-cultural realities of allotment gardens. At the same time, it could be argued that the German cultural context resurfaces through the main character's sense of place that is anchored in memory and a nostalgic connection to the garden, the land and its vegetation. I do not, however, want to pigeonhole this novel as either German or European in its depiction of a sense of place. Clearly, the novel contributes and participates in both. What I do want to illustrate is the way the text goes on to imagine less anthropocentric ways of thinking about place and place-making by tending to the non-human world and reframing the trope of the apocalypse not as finite but in ecological terms as an infinite series of cyclical 'endings.'

Although the novel leaves out any details about why "the birds in the city were screaming day and night and the world was ending" (35)[126], extreme weather patterns (rain, storms, and heat waves), the unpredictable nature of an invisible threat, and the novel's concluding descriptions of the city as an inferno clearly relay fears related to climate change. Contrasting the past with a grim present and "the announced end of the world" (44)[127], the novel leaves no doubt about its contribution to the global apocalyptic imaginary. Yet, it reveals ways of creating a sense of place, on the one hand, by imagining nostalgic connections to past environments, and, on the other hand, by developing expanded notions of place that include other-than-human life forms. In this way, the

[126] "…die Vögel in der Stadt Tag und Nacht schrien und die Welt unterging." (35)
[127] "dem angekündigten Ende der Welt" (44)

novel takes up general questions about how to feel at home in a hostile world where the future of humanity is uncertain.

To depict the places in which the main character Anton Winter has lived, the text connects them to different moments in the story and to the changes of the seasons. The garden colony's past is predominantly associated with spring and summer, whereas in the fall it is portrayed in ruins but also associated with the abundance of the harvest season. Set in the winter, the novel's ending suggests that the imagined apocalypse is not an end, but rather the continuation of a seasonal cycle of life and death that includes other-than-human forms of life, such as the plants in the garden that keep flourishing in and around Anton's childhood home. As Pascale Laplante-Dubé asserts, "the winter replaces apocalyptic notions of linearity and finality with the cycle of the seasons that connects endings and beginnings" (11, my translation from French original). The city, on the other hand, is presented as "cold and dark" (21)[128], a place where "you are always a stranger" (78)[129] and where inhabitants "grew thin with worry" (47).[130] Indeed, no seasonal changes mark the urban space. The garden[131] and the city are described as "two worlds so opposite that people in the garden didn't talk about the city and people in the city didn't talk about the garden," and this, despite the fact that they are separated by only an "hour-long drive" (10).[132]

The first chapter gives readers access to the past of Anton's "holy childhood in that garden" (33)[133], as he grew up in a multigenerational household, in a place where communities felt at home

[128] "Die Stadt schien ihnen nunmehr kalt und dunkel…" (21)
[129] "In der Stadt ist man immer fremd." (78)
[130] "Wie Anton Winter wurden viele dünn vor Sorge." (47)
[131] More generally, garden community initiatives can be situated in relation to the urban in so far as they embody the desire to know an environment by connecting to its flora and fauna. The very idea of allotment gardens or "Kleingartenkolonien" in Germany has its roots in the desire to counter the fast-paced rhythm of modernity: "Allotment gardens are a product of industrialization; life conditions for the urban working class were unhealthy, and gardens alleviated social ills providing proximity to nature, light and air, healthy food, and community" (Bigell 108).
[132] Diese einstündige Fahrt verband so zwei gegensätzliche Welten, dass man im Garten nicht über die Stadt und in der Stadt nicht über den Garten sprach… (10)
[133] "Es war eine heilige Kinderzeit in diesem Garten." (33)

and lived in harmony with the natural environment. Founded "when the state was dissolving, and the city had become desolate and man so perplexed that he had to go into nature to renew himself" (9)[134], the text portrays the garden as an alternative way of living together and relating to nature. Fostering a sense of community and shared by a collective, the garden reconnects people to the food they eat and the ecosystems that sustain them.[135] However, this ideal of the garden as a communal sense of place in opposition to the placelessness of urban spaces, does not hold. Living off the land is presented as no longer achievable, and community members who need sources of income other than the non-monetary resources provided by the land commute to the city that provides other kinds of work.

A second way in which the text develops a sense of place is in the careful attention it pays to the vegetation, sounds, and colours of the garden. Rather than name specific geographical locations like in *The Swarm*, the novel identifies and names specific flora and fauna:

> At the height of the flowering season, the air was full of peculiar smells and thousands of insects that rose like a low murmur. Songlike and tropical it bloomed. Cadet blue, imperial blue, pale orange, plum yellow. The columbines smoldered. The monkshood glowed. [...] In the herb garden, the goldenrods and yarrows proliferated as if they wanted to get out of the soil. There was arnica and angelica, green peppermint and St. John's wort… (23)[136]

[134] " …als der Staat sich auflöste und die Stadt trost- und der Mensch so ratlos geworden war, dass er in die Natur gehen musste, um sich zu erneuern." (9)

[135] Conceived as "a collection of people as different as day and night that united one idea," (Fritsch 9) the garden colony's past resembles the allotment gardens described by Bigell: "Allotment gardens invite a rethinking of the current fetishizing of mobility, flexibility, and placelessness, as well as to see a sense of place as the product of involvement, work, and creativity in community. This community is bound to territory, and it depends on its status as a commons, being exempt from valorization." (120)

[136] "Zur Blütezeit war die Luft satt an eigenartigen Gerüchen und Tausenden Insekten, die wie ein leises Murmeln aufstiegen. Liederlich und tropisch blühte es. Kadettenblau, kaiserblau, blassorange, zwetschgengelb. Die Akeleien schwelten. Der Eisenhut brannte. […] Im Kräutergarten wucherten die Goldruten und Schafgarben, als wollten sie aus der Erde hinaus. Es gab Arnika und Engelsüß, grüne Pfefferminze und Johanniskraut… " (23)

This is a way of remembering individual plants in the garden and acknowledging the presence of other-than-human forms of life. Anton's perception of trees and the malleability of their form (i.e., as tonewood used by his father to build instruments) further illustrates the relationship that the people living in the garden colony cultivate with their surrounding environment:

> The slower the trees grew, the closer together the annual rings grew, becoming tonewood dense enough to carry the tones with which the resonators filled. A magical cycle worked between wood and man. It seemed as if one could become the other at any time. Nothing had to remain what it was. Everything was malleable, even in its function. The core of the world seemed to be a *nucleus movens* that hid once in one shell and then in another. (28)[137]

As a child, Anton experiences the natural world as enchanted, aware of the garden as an interconnected, cyclical, and dynamic ecosystem. Spending time outside and experiencing "the narrowness and vastness of nature" as "unfathomable and impressive" (33)[138] shape his life in the garden colony. The text further points to the effects of the physical environment on its inhabitants as a "roughening [of] the smooth character with which one was born" (33).[139] Throughout the novel, Fritsch foregrounds the relationship between environments and bodies: "the soil and mountains, [...] were reflected in the angular faces of its inhabitants, and [...] the tides washed away those very edges and wrinkles" (10).[140]

Set in the city where Anton lives as an adult, the second chapter moves from his past life in the garden colony to an urban space marked by "more frequent storms" (58)[141], environmental

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[137] "Je langsamer die Bäume wuchsen, desto enger saßen die Jahresringe aneinander und wurden so zu Klangholz, das dicht genug war, um die Töne, mit denen sich die Resonanzkörper füllten, zu tragen. Zwischen Holz und Mensch wirkte ein magischer Kreislauf. Es schien, als könne jederzeit das eine auch zum anderen werden. Nichts musste bleiben, was es war. Alles war formbar, auch in seiner Funktion. Der Kern der Welt schien ein *nucleus movens* zu sein, der sich einmal in der einen und dann in einer anderen Schale versteckte." (28)

[138] "Die Enge und Weite der Natur waren unergründliche und eindrückliche Erfahrungen…" (33)

[139] "… die den glatten Charakter, mit dem man geboren wurde, aufrauten." (33)

[140] "Die beiden Orte existierten wie parallele Universe, eines, in dem es nichts als Erde und Berge gab, die man in den kantigen Gesichtern der Einwohner wiederfand, und eines in dem die Gezeiten eben diese Kanten und Flaten davonwuschen." (10)

[141] " häufiger werdende[n] Unwetter" (58)

decline, and a dystopian atmosphere caused by fears and uncertainties related to an unnamed approaching cataclysmic event. Living on the rooftop of a skyscraper Anton is a bird breeder, surrounding himself with different kinds of birds that "live[d] around him in front of his windows" and "flutter[ed] under small domes and behind bars in his living room" (44).[142] The birds signal some of the changes that render the city unfamiliar and strange; for example, the roosters "had become pale, more colorless to him [Anton] than they had seemed a few months ago, as if they suspected that the end was near" (45).[143] The reasons for this dystopian reality remain unknown. It is the reader who makes the connection to the environmental decline and shifting weather patterns of contemporary climate change.

The urban environment is portrayed as a space made up of individuals who cope with the anxieties related to a loss of a sense of place and extreme social isolation. Anton's elevated perspective emphasises the individualism and anonymity of the city. Looking down from a glass cube on top of a high-rise building, Anton observes this solitude like a surveillance figure in the panopticon:

> Below him, the city lay awake, although the streets were empty and silent at the moment. [...] Night after night Anton looked from the top floor of the high-rise building into the windows of the smaller housing blocks in the neighborhood. He saw an old woman combing back the sparse, greasy hair of her husband, who was staring helplessly at the wall, with certain hand movements [...]. With care he looked at them all and without surprise. He drew them close in his binoculars, so that they, who believed themselves unobserved, were within his reach with all their gestures and their secret life, which one leads only when one is alone with oneself. From time to time he lowered the binoculars, embarrassed by the carefree intimacy he was witnessing. (38-39)[144]

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[142] "Die Vögel, all die Vögel. Sie wohnten um ihn herum vor seinen Fenstern, und sie flatterten unter kleinen Kuppeln und hinter Stäben in seinem Wohnzimmer." (44)

[143] "Die Hähne aber waren blass geworden, farbloser kamen sie ihm vor als noch vor ein paar Monaten, als ahnten sie, dass es bald zu Ende ginge." (45)

[144] "Unter ihm lag die Stadt wach, obwohl die Straßen im Augenblick leer und still waren. […] Nacht für Nacht sah Anton aus dem obersten Stockwerk des Hochhauses in die Fenster der kleineren Plattenbauten in der Nachbarschaft. Sah, wenn doch mal die Lichter angingen, wie eine alte Frau mit bestimmten Handgriffen ihrem Ehemann, der hilflos die Wand anstarrte, das spärliche fettige Haar zurückkämmte […]. Mit Sorgfalt betrachtete er sie alle und ohne Überraschung. Dicht heran holte er sies ich im Fernglas, so dass sie, die sich alle unbeobachtet glaubten, ihm zum

This bird eye's view contrasts the garden environment as a place associated with specific memories of community, immersion in an ecosystem and in tune to the seasonal changes of environment. The text further explores the urban sense of placelessness by raising the issue of finding a way to cope with the overwhelming reality of "the world ending" (35). When faced with the intense urgency of impending doom, a world falling "into a thousand pieces" and where "people slept together [...] Lust and love grew out of the fear of death. Every touch went deep under the skin [...] they hung on to the mere life of the other" (60-1).[145] On a metatextual level, the novel refers to the impossibility of expressing how it feels to live in this dystopian world when Anton comments that he "had always distrusted language and its countless possibilities for misunderstanding, whether written or spoken" (63).[146]

But such fear of death is not the only emotion that characterizes urban life. Anton's lover, Frederike, copes with feelings of placelessness and estrangement by caring for others and seeking an affectionate environment:

> Some days, Frederike perceived the hospital corridors as wide fields full of bodies, children, lovers and families, curled around their loved ones like a shell, yet unable to protect anyone. [...] And yet it was the most beautiful place to her, the best place in the city. Everything was alive. Everything was growing. Nobody gave up. Everyone wanted to protect what was close to their heart. (94)[147]

Greifen nahe waren mit all ihren Gesten und ihrem heimlichen Leben, das man führt, wenn man allein mit sic hist. Von Zeit zu Zeit ließ er den Feldstecher sinken, peinlich berührt von der sorglosen Intimität, deren er Zeuge wurde." (38-39)

[145] "Während draußen die Welt in tausend Stücke fiel, schliefen die Menschen miteinander, weil sie nichts anderes anzufangen wussten mit ihren heilgebliebenen Körpern, als sie zusammenzukleben zwischen all den Scherben. Lust und Liebe wuchsen aus der Todesangst. Jede Berührung reichte bis tief unter die Haut. (60-1)

[146]…überhaupt hatte er der Sprache und ihren zahllosen Möglichkeiten zum Missverständnis immer misstraut, ob geschrieben oder gesprochen." (63)

[147] "An manchen Tagen schienen Frederike die Krankenhausflure weite Felder voll mit Köpfen, Kindern, Liebespaaren und Familien, die sich wie eine Schale um ihre Liebsten krümmten und doch niemanden beschützen konnten. […] Und doch war es ihr der schönste Ort, der beste Ort der Stadt. Alles lebte. Alles wuchs. Niemand gab auf. Jeder wollte retten und schützen, was ihm auf dem Herzen lag." (94)

Here, the reader is reminded of the tropes of children and parenthood that are meant to create a sense of hope, a sense of future for human life on the planet in apocalyptic literature. The novel evokes this trope again when Anton and Frederike are joined by parents and a newborn upon their departure from the city. However, this trope fades into the background in the novel, replaced by a focus on the garden's lush vegetation, a sign of continued life in less anthropocentric terms.

Upon returning to the garden of his childhood, Anton reveals to what extent his sense of place was built on memories. The absence of specific smells triggers additional childhood memories, which illustrates once again that his attachment to the garden is anchored in past experiences:

> Of course, the place had become something else, the house of the dead, and something it had not been when he lived here: a memory, a museum of his own past, the seed of his melancholy nostalgia. It also had a smell that was unfamiliar to him. The corridors that had once exuded a mixture of roasting aromas and pipe smoke, vinegar, cinnamon, sweat, the haze of gelatin in the hot jam, and the cool draught of the pantry, now smelled more of animals and forest than of people. (109)[148]

The garden is both an imaginary place that Anton revisits in his mind and an actual place in ruins. Unlike the global perspective of *The Swarm* or Wittig's reconfiguration of the pastoral in a global context, Fritsch explores how a local sense of place evolves over time and imagines what this sense of place looks like in an apocalyptic setting.

[148] "Natürlich war der Ort zu etwas anderem geworden, zum Haus seiner verstorbenen Großeltern und Elter, einem Haus der Toten, und zu etwas, das es damals noch nicht gewesen war, als er hier lebte; einer Erinnerung, einem Museum seiner eigenen Vergangenheit, der Keimzelle seines Wehmuts. Auch der Geruch war ihm nicht vertraut. Die Korridore, die ehemals eine Mischung aus Röstaromen und Pfeifenrauch, Essig, Zimt, Schweiß, dem Dunst der Gelatine in heißer Marmelade und dem kühlen Zug der Speisekammer verströmt hatten, rochen nun mehr nach Tier und Wald als nach Menschen." (109)

Although the garden Anton returns to is in ruins, no longer the site of children playing, it is still a green space teeming with plant life. He (re)constructs a sense of place based on this blend of past memories and the presence of plants:

> Once again the tiger lilies sprawled before him in the darkness, and he saw the columns of gnats rising before him like smoke from the meadows. He remembered that they had carried the mullein plants like torches through the garden and that the yellow bells of the flower umbels seemed to accompany these children's processions of the night with a soft ringing. (120)[149]

Evoking "an old-fashioned lust for life that seemed to pay homage to the past times that had been experienced here" (124)[150], the garden represents decay and growth not as mutually exclusive but as part of a continuous cycle. Apocalypse does not mark the end of all life. Plants continue growing in the now abandoned colony. Human constructions become habitats for plants:

> Shyly the garden had come into the house, had crowded into the attics as vines between the window crosses, had crawled up the stairs as moss, had blossomed in the cracks in the walls and in the plaster, had covered the wooden floorboards with strange flowers. (108)[151]

According to Laplante-Dubé, "the alliance between the ruins and the garden gives rise to a different network of meanings, reflecting a cohabitation, even a communication, between the human and the non-human" (11, my translation). I would emphasize instead the use of active verbs (i.e., crawling, blossoming, or covering) that underscore the garden's flourishing vegetation independent from human characters. This botanical imaginary opposes reductive conceptions of

[149] "Noch einmal wucherten die Tigerlilien vor ihm in der Dunkelheit, und er sah die Säulen aus Mücken wie Rauch aus den Wiesen aufsteigen. Er erinnerte sich, dass sie die Königskerzen wie Fackeln durch den Garten getragen hatten und die gelben Glöckchen der Blütedolden diese Kinderprozessionen der Nacht mit einem leisen Läuten zu begleiten schienen." (120)

[150] "Der Garten beschwor eine altmodische Lebenslust herauf, die den vergangenen Zeiten, die hier erlebt worden waren, zu huldigen schien." (124)

[151] "Schüchtern war der Garten in das Haus gekommen, hatte sich als Wein zwischen den Fensterkreuzen in die Dachammern gedrängt, war als Moos die Treppen hinaufgekrochen, war in den Mauerrissen und im Putz erblüht, hatte die Holzdielen mit seltsamen Blumen übersät." (108)

plants as "sessile (unmoving), silent (lacking address), passive (acted upon by mobile life-forms), and, of course, pleasing (agreeable to the senses)" (Ryan 1). No longer cultivated or maintained by humans, plants form their own sense of place through their roots, growing everywhere and expanding their living space. Whereas descriptions of the city focus on the struggle for human survival, the botanical is at the centre of the apocalyptic sense of place that Anton develops in the final chapters of the novel. The garden functions as an archive not only for Anton's childhood memories but also for the numerous plant species named in the text (i.e., vines, moss, tiger lilies, mullein plants etc.), connecting human and plant life, which is described as "an organic ribbon that closed around the family history and held it between its leaves and roots" (125).[152]

As Anton and Friederike await the apocalypse, they recreate a sense of place that is anchored in a nostalgic connection to the garden, their love for each other, and an acceptance of death as part of an ecological cycle that includes non-human life. They can see the apocalypse as an intense fire "so big that it was visible even from space," approaching from the city that "burned as if a match had been struck and stuck between the middle of a haystack" (151).[153] Once again, the reader is reminded of the increased risk of wildfires that has become part of the collective climate change imaginary. Yet, in the end, the text imagines a post-apocalyptic dream space where the garden still exists, avoiding a sense of closure:

> After the world ended, it played Joy Division and Rachmaninoff in Anton's dreams in the morning hours. He woke up under Frederike's long hair and looked out. There was a silence in the fields after that and then: nothing for a long time. Around the corner a tall man turned, dragging a suitcase in the shape of a violin behind him. His footsteps plowed the snow. Shadows burst out of the forest, carefully following in his footsteps into the shelter of the courtyard. Somewhere on the horizon, two tightly embraced figures moved millimetres

[152] "Ein organisches Band, das sich um die Familiengeschichte schloss und sie festhielt zwischen seinen Blättern und Wurzeln." (125)
[153] "Es musste ein gewaltiges, kilometerhohes Feuer sein, dass man es von hier aus noch ausmachen konnte, ein Brand so groß, dass er auch aus dem All sichtbar war. Die Stadt brannte, als habe man ein Streichholz angerissen und in die Mitte eines Heuhaufens gesteckt." (151)

> across the curve of the earth toward the house, as slow and small as if they had been on a long march. All of them came into the garden. (154)[154]

The text expresses the trauma of living through an apocalyptic event, using the symbolic language of dreams and music and the ambiguities of a dream space. The reader is left with a sense of human longing to be together in a safe space and to bring beauty into destroyed places. At the same time, the novel imagines the future as cyclical with room for different kinds of possible endings. The garden and its vegetation evoke a sense of place that counters apocalyptic ruptures. The novel ends with the imagery of new memories being formed in the garden, which highlights Anton's and Friederike's bond to the local environment in the face of global apocalypse.

IV. Conclusion

By narrating a broad range of environments, from the ocean (*The Swarm*), the countryside (*By The Sward*), to urban and garden spaces (*Winter's Garden*), the three cli-fi texts analyzed in this chapter illustrate ways of imagining place from both anthropocentric and non-anthropocentric perspectives in an increasingly climate-changed world. Although these texts articulate place each in their own individual way, they all imagine environments and experiences in response to an endangered or ruptured sense of place. In *The Swarm*, the yrr threaten humans and remind them of the negative ripple effects of environmental exploitation, but they also illustrate a new watery sense of place. Difficult to access through the means of science, technology, and land-based logic,

[154] "Nachdem die Welt untergegangen war, spielte es in Antons Träumen Joy Divison und Rachmaninow in den Morgenstunden. Er erwachte unter dem langen Haar Frederikes und blickte hinaus. Auf den Feldern gab es eine Stille danach und dann: lange nichts. Um die Ecke bog ein großer Mann und zog einen Koffer in der Form einer Geige hinter sich her. Seine Schritte pflügten den Schnee. Aus dem Wald brachen Schatten hervor, die sorgfältig in seine Spuren traten und ihm in den Schutz des Hofes folgten. Irgendwo am Horizont bewegten sich zwei eng umschlungene Gestalten milimeterweise über die Erdkrümmung auf das Haus zu, so langsam und klein, als hätten sie einen langen Marsch hinter sich. Alle kamen sie in den Garten." (154)

the deep ocean in *The Swarm* represents an environment where anthropocentric notions of place dissolve and other-than-human viewpoints give rise to alternative forms of dynamic attachment.[155] While Schätzing looks to the more-than-human world for new understandings of place, Wittig focuses on the body as a site of place attachment. By adding the threat of terrorism to the challenges of working at a sheep farm in climate-changed conditions, *By The Sward* depicts an embodied sense of place. Moreover, it does not attempt to reconstruct an abstract, geographical global scale as Schätzing does, but instead sticks to the experience of individual, affective perceptions of global risk. Whereas Wittig critiques the idealization of the rural in the pastoral imagination, Fritsch comes back to nostalgic notions of environments like gardens that allow for reconnecting with the natural world. *By The Sward* and *Winter's Garden* share a concern for cultivating and re-creating a local sense of place in the face of global threats.

And what about the role of cultural specificities in these local-global dynamics? *The Swarm* seems to lack a clear articulation of a German sense of place and does not factor in local context. As a best-selling German novel that has been translated into multiple languages, it circulates in a much more international context and appeals to a wide readership by using science and knowledge-based themes. As a thriller, it subscribes to something more generic, whereas the pastoral genre in Wittig's novel is already more specific, appealing to images of sheep farming while also evoking the experience of climate change. *By The Sward* and *Winter's Garden* both question the meaning of place in the face of environmental destruction and climate change. Wittig's novel does not take place in Germany, and Fritsch's story does not name any specific geographical locations at all, which may be an attempt to distance these stories from a culturally specific sense of place. This

[155] Fritsch also articulates place in less anthropocentric terms through the lens of the botanical and uses the symbolic and associative language of dreams and memories to imagine an apocalyptic sense of place that tends to other-than-human life forms.

prompts one to consider how contemporary German-speaking authors of cli-fi can contribute to the global understanding of place. Perhaps their contribution is to show that moving away from culturally-bound perspectives is necessary to imagine a world where territorial or land-based norms no longer apply.

CHAPTER FOUR

QUESTIONS OF TEMPORALITY:

DEVELOPING A HUMAN AND NON-HUMAN FUTURE- PRESENT

As "a medium to explain, predict, implore, and lament" (Trexler, *Anthropocene Fictions* 9), cli-fi texts are particularly concerned about the complex temporalities of a crisis that occurs on vast geological timescales and fundamentally transforms our understanding of a now and a future. As texts that imagine many of the possible effects of long-term shifts in temperatures and climate, cli-fi faces the narrative challenge of creating stories within multiple time scales (i.e., human, non-human, evolutionary, geological, microscopic, etc.) and accounting for the "representational intractability of climatic temporality" (Menely 479). As historian Dipesh Chakrabarty emphasizes, "the climate crisis produces problems that we ponder on very different and incompatible scales of time" ("Climate and Capital," 1). How authors of cli-fi navigate the tensions that arise when trying to map deep geological time onto human time scales or articulate altered conceptions of time, varies. *The Swarm* follows chronological narrative patterns and uses scientific knowledge and extrapolation to imagine an apocalyptic future rooted in current or past destructive human behaviours. Boysen's novel *Alice* is an example of a cli-fi text that tries to narrate geological timescales as its main character experiences multiple moments in Earth time within climate models and learns about climatological concepts that require a global perspective, such as tipping points. However, the novel pairs this thinking about planetary scales with anthropocentric temporalities that prioritize human scales. At the end of her journey, for example, Alice travels to a future in which scientists have 'solved' the climate crisis, which reduces the novel's depiction of timeframes to the idea of human survival. Other texts, such as *Milk Teeth* and *Winter's Garden*, lack references

to geological timescales or explicit temporal markers and instead use memory and a generational perspective (i.e., the mother-daughter relationship in *Milk Teeth* or Anton's childhood memories in *Winter's Garden*) to convey a sense of how it feels to live through climate-changed times. While thinking about time scales in generational terms is centred around a concern for human survival, some authors are able to counter human conceptions of time by bringing in elements of non-human time scales such as plant growing cycles.

Leona Stahlmann's novel *Diese ganzen belanglosen Wunder/All These Petty Miracles* (2022, not yet translated into English)[156] combines human and non-human conceptions of time as well. On the one hand, the text explicitly refers to familiar climate change events that are currently happening, such as wildfires and other extreme weather events (i.e., "the cities are burning up, beyond the Alps people wear face masks against the smoke and no longer get a tan, and in Greece, Italy, France the fields and forests are burning," 359)[157], or are predicted to occur in the near future (i.e., "in Venice, scallops grew in the flower boxes of the balconies on the second floor instead of begonias," 40).[158] On the other hand, the novel interrogates common conceptions of the future as a linear event on a timeline by zooming in on the dynamics of a single ecosystem, namely a salt marsh. It recreates wetlands within the literary space and uses them as a medium to contemplate and creatively examine how climate change is affecting our notions of the future, our relationship with the living world, and our sense of hope. The marsh resists and permeates anthropocentric temporalities and nature-culture dualisms, which requires alternative ways of thinking about time.

The novel's main character is a young boy named Zeno, who lives in an abandoned saltworks in a marsh near a river with his mother, Leda. One day, Leda disappears, and Zeno is

[156] All English quotes from the novel in this chapter are my translations, with the German original in the footnotes.
[157] "den Städten verbrennen die Reiseziele, jenseits der Alpen trägt man Gesichtsmasken gegen den Rauch und wird nicht mehr braun, und es brennen in Griechenland, Italien, Frankreich die Felder und die Wälder." (359)
[158] "In Venedig wuchsen in den Blumenkästen der Balkone im zweiten Stock Jakobsmuscheln statt Begonien…" (40)

left alone until he meets Katt, a young woman he connects with through a dating app. Katt, together with a small group of other city dwellers, moves in with Zeno, and the marsh starts to shape her sense of place and time. The novel juxtaposes critical reflections on destructive human behaviours and human agency in the Anthropocene with an environmental imagination that emphasizes non-human agencies and narrates the marsh as "storied matter" (Iovino and Oppermann). It also explores "the perplexing untimeliness of wetlands and the forms of resurgence they exhibit —both in the literary past and the ecological present" and "what Haraway calls 'unfinished configurations' of time" (Eklund 461). In this way, it illustrates the incredible potential of cli-fi to challenge our sense of climate change as unfolding on a single timeline.

I will first situate the novel within the literary cli-fi genre and discuss the narrative strategies used to represent contemporary climate change concerns and the ethical dilemmas of an unimaginable, uncertain, and catastrophic future. Shifting the focus of my analysis to the marsh, I will show how the novel captures non-human ways of meaning-making and storytelling in ways that "do not assume a desiccated future but instead mind the material and temporal indistinction of the terraqueous" (Eklund 461). My analysis asks how the text uses the indistinctiveness of the marsh to complicate notions of temporality. To this end, I will demonstrate that the text moves from articulating climate change as a problem of the present to imagining different kinds of non-human temporalities that emerge in the marsh. By examining processes of erasure and impermanence, I highlight the ways in which the marsh resists fixed anthropocentric notions of place and time, which creates a sense of a future-present. In addition, by placing humans within the marsh, the novel imagines an altered sense of place that reveals other-than-human-centred conceptions of memory and archive. Finally, I will discuss how the novel articulates a critical

sense of hope that moves away from a single future outlook and opens up many different futures including the possibility of a planet without humans.

I. *Miracles* as cli-fi of the now

Wir haben nicht mehr das Recht im Früher zu leben. (60)
We no longer have the right to live in the Before. (60)

As ecocritic Antonia Mehnert explains, "unlike the temporal representation in scientific diagrams, in which the future indicated on the x-axis spatially marks the difference between the reader's present and his future, climate change fiction deliberately challenges this division: past, present, and future become inseparably intertwined, thereby highlighting that the dangers of tomorrow are already present today" (94). Stahlmann's novel illustrates particularly well how cli-fi challenges and interrogates linear temporal representations.

Written in the third person, the first part of the novel focuses on Leda's life in an abandoned salt marsh with her son Zeno. Struggling with feelings of guilt towards Zeno, who "knows that species are dying out" (99) and that "good weather is when nobody dies in the process" (120), Leda's perspective is essential for how the novel presents climate change as a crisis of the now, as she explains to Zeno: "Me and the others, we've ruined the Later for you, we don't have the right to live in the Earlier, but it's the only place we know, we have no other." (60)[159] This raises the question of generational responsibility and emphasizes the urgency of climate change as a problem of the present. The text explores how a crisis that unfolds beyond human timescales transforms our sense of time:

> If it wasn't the way it is, for example, it could have been nice. That summer, when Leda was nine months pregnant, the newspapers ran headlines about the thermometer reading

[159] "Ich und die anderen, wir haben dir das Später kaputt gemacht, wir haben nicht das Recht, im Früher zu leben, aber es ist der einzige Ort, den wir kennen, wir haben keinen anderen." (60)

> forty-seven degrees for the first time. She thought it would be impossible to raise a child now. To raise this child. Then the child came. (37)[160]

If the temperatures had not been rising to forty-seven degrees, raising a child would not have been an impossibility. By mixing the past tense with the present tense and the conditional perfect, the reality of living in a climate-changed world with rising temperatures is contrasted with an imaginary scenario that did not occur. Here, climate change ("the way it is") is not depicted as a future problem but as a rupture that alters how things could have been. Through the depiction of Leda's experience of motherhood in a climate-changed world and 'could have been futures,' the novel articulates a temporality that is marked by a sense of urgency and despair.

To reinforce and problematize this temporality, the novel switches to a collective 'we' that foregrounds climate change as an all-encompassing crisis of the here and now. As Leda reflects on the impact of past and current generations on her son's future, for example, the narrative perspective changes from Leda's voice in the first person, asking, "Can I still feel heartache when the world is ending?" (125)[161], to a collective 'we' that is guilty of destroying the possibility of a future:

> [M]y people have set fire to his future, no, we didn't even manage that, we're not the arsonists, we're not the fire extinguishers, we're nothing, just in the middle of it, fed fat and immobile by what our parents stuffed into our mouths, and when we realized that it was our children's future we were eating, our mouths went stale and it tasted like what it was, the ashes of a fire, but we kept on swallowing mechanically, a reflex like stretching the knee under the hammer, we couldn't help it, we knew nothing else, we kept on eating until there weren't even ashes left for our children. (125)[162]

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[160] "Wenn es nicht wäre, wie es ist, hätte es zum Beispiel schön sein können. In dem Sommer, als Leda im neunten Monat schwanger war, titelten die Zeitungen zum ersten Mal das Überschreiten der Thermometeranzeige bei siebenundvierzig Grad. Sie dachte, es würde unmöglich sein, jetzt noch ein Kind großzuziehen. Dieses Kind großzuziehen. Dann kam das Kind." (37)

[161] "Darf ich noch Liebeskummer haben, wenn die Welt untergeht, fragt Leda." (125)

[162] "…meine Leute ihm die Zukunft angezündet haben, nein, nicht einmal das haben wir zustande gebracht, wir sind nicht die Brandstifter, wir sind nicht die Feuerlöscher, wir sind gar nichts, nur mittendrin, dick und unbeweglich gefüttert von dem, was unsere Eltern uns in die Münder gestopft haben, und als wir kapiert haben, dass es die Zukunft unserer Kinder war, die wir da fressen, da ist uns im Mund schal geworden und es hat geschmeckt wie das, was es

In this passage, the collective 'we' expresses the impossibility of acting any differently in a fictional now that very much resembles that of the contemporary reader. Temporality is expressed in generational terms and echoes the idea of "posterity-as-parenthood," which refers to the "alignment of present humans' obligations not to damage ecosystems and the species that live in them with a set of moral obligations towards future humans" (Johns-Putra, *Climate Change and the Contemporary Novel* 10). However, the novel negates the possibility of a 'better future' for 'our children' and reminds the reader that "it can't end well" (368)[163] because the threshold of reversing climate change has already been crossed. The reader is implicated in these collective responsibilities as the novel portrays the climate crisis as the "perfect moral storm" that occurs "in the global, intergenerational, and theoretical dimensions" (Gardiner 23).

To further convey these moral dilemmas and ethical responsibilities, the novel homes in on some of the causes of the terrible effects of climate change. In a two-page long section, the collective 'we' is again incriminated for its role in consumerism and romanticized images of nature, especially maritime environments. The novel condemns the ignorance of Western capitalist societies towards the realities of anthropocentric capitalist-driven climate change:

> *We have turned our backs on the oceans, beaches and bays, headlands, islands and archipelagos and dunes, sounds and sandbanks and skerries; coral reefs have long since disappeared. Gone are the days when mankind considered the uplifting, tossing, smoothing of the waves, the pearly white teeth of the surf closing around their ankles, relaxing. When we are promised a sea view in the restaurant, we don't see the sea, we see ourselves. We see rolling and rumbling onto the beach everything we have been taking in decades of planetary plundering, we see above all what we have barely used and have already thrown away.* (292)[164]

war, die Asche eines Brandes, aber wir haben mechanisch weitergeschluckt, ein Reflex wie das Strecken des Knies unter dem Hämmerchen, wir konnten nicht anders, wir kennen nichts anderes, wir haben weitergefressen, bis für unsere Kinder nicht einmal mehr die Asche übrig war…" (125)

[163] "Es geht nicht mehr gut aus." (368)

[164] "*Wir haben den Ozeanen, den Stränden und Buchten, Landzungen, Inseln und Archipelen und Dünnungen, Sunden und Sanbänken und Schären den Rücken gekehrt, Korallenriffe gibt es schon lang nicht mehr. Die Zeit, in der die*

Written in italics and set apart from the main narrative, this passage interrupts the narrative flow, once again pulling the reader in with the use the collective 'we'. The combination of past tense (i.e., to describe the disappearance of the coral reefs) and present tense emphasizes the irreversibility of the destruction and depicts climate change once again as a crisis of the now. Because of "decades of planetary plundering," the oceans are no longer a place of solace and have become a kind of landfill for that which "we have barely used and have already thrown away" (292). This critical voice squarely centres the novel in the climate fiction genre, underscoring climate change as a contemporary problem and highlighting the paradoxical nature of a climate-changed future that has already occurred. Readers must situate themselves with respect to this collective and critically reflect on their role in anthropogenic climate change.

The novel occasionally shifts into a cynical tone that confronts the doomsday atmosphere resulting from the realization of imminent catastrophe. For example, the character of Katt, a young woman who moves from the city to the marsh, is highly critical of her own and others' apathy and cynicism towards climate change in the city. In her first-person account of her previous life in the city, Katt describes playing a drinking game that illustrates how gallows humour serves as a coping mechanism to deal with this sense of hopelessness and paralysis:

> We had a drinking game, it went like this: We sat in a circle around the 8 o'clock news. When they had nothing to do with us, we drank. We drank all the time. Then we realized

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Menschheit das Aufrichten, Umschlagen, Ausglätten der Wellen, die perlweißen Zähnchen der Brandung, die sich um ihre Fußknöchel schlossen, entspannende gefunden hat, ist vorbei. Wenn man uns einen Meerblick im Restaurant verspricht, sehen wir nicht das Meer, wir sehen uns selbst. Wir sehen an den Strand rollen und poltern alles, was wir in den Jahrzehnten der planetaren Plünderungen genommen haben, wir sehen vor allem das, was wir kaum gebraucht und schon wieder fortgeworfen haben..." (292)

> it. Swallowed dry. And drank some more. We had settled in well at the edges of the catastrophe. We knew we had to endure watching. (169)[165]

In this way, the novel constructs a second 'we' of which Katt is representative, a 'we' that focusses on the daily, specific practices of living in a climate-changed present.

As Rob Nixon points out, much environmental destruction goes unseen because it does not occur at the speed of spectacle and because it does not happen in the West. This is also true of many of the effects of climate change. To trace the causes of this "slow violence" (Nixon), Katt speaks to the ways in which a collective 'we' participates in such violence. Her cynicism drives home the severity and the reality of global inequalities:

> [W]e are outgrowing the facts of our planet, [...] forty-three thousand branches of a fast food chain, where in just twelve steps you can choose from fifteen different types of bread and thirty-six spreads [...] to assemble a sandwich the length of three and a half average Central European children's feet up to the age of twelve, the second half of which is statistically thrown away uneaten in the vast majority of cases in the branches of a medium-sized city in one day, if collected, would be enough to feed the average five children of Mexican avocado farmers whose land is shriveling up in the ongoing drought caused by the plantation-by-plantation cultivation of avocado plants, whose avocados are used in the guacamole of the sandwich (...) (380-81)[166]

The contrast between food waste in the West and the plight of avocado farmers in Mexico whose land is negatively impacted by such behaviours illustrates the kind of "violence that occurs

[165] "Wir hatten ein Trinkspiel, es ging so: Wir setzten uns im Kreis um die 20-Uhr-Nachrichten. Wenn sie nichts mit uns zu tun hatten, tranken wir. Wir tranken andauernd. Dann merkten wir es. Schluckten trocken. Und tranken noch mehr. Wir hatten uns an den Rändern der Katastrophe gut eingerichtet. Wir wussten, dass es uns nicht zuerst erwischen würde. Wir wussten, dass wir das Zusehen aushalten mussten." (169)

[166] "Wir wachsen mit unseren gestreckten Körpern über die Faktenlage unseres Planeten hinaus […] dreiundvierzigtausend Filialen einer Schnellimbisskette, in der man in nur zwölf Schritten aus fünfzehn verschiedenen Brotsorten und sechsunddreißig Aufstrichen […] ein Sandwich in der Länge von dreieinhalb durchschnittlichen zentraleuropäischen Kinderfüßen bis zwölf Jahren zusammenstellen kann, deren statistisch in der überwiegenden Mehrheit der Fälle unverspeist weggeworfene zweite Hälften der an einem Tag in den Filialen einer mittelgroßen Stadt verkauften Sandwichexemplare, würde man sie sammeln, ausreichen würden, um die im Schnitt fünf Kinder der mexikanischen Avocadobauern satt zu machen, deren Ländereien in der anhaltenden Dürre zusammenschnurren, die das plantagenweise Anbauen von Avocadopflanzen verursacht, und deren Avocados in der Guacamole der Sandwichkette verarbeitet werden…" (380-81)

gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (Nixon 2). By revealing this violence, the novel introduces another temporality, a slowness within the urgency of climate change as experienced in the West.

As Katt continues to reflect on living in "a time when history is being written by the minute, and yet we miss it by a hair's breadth every time" (213)[167], she creates additional connections between the experience of climate change as both short- and long-term temporality:

> We read about flash floods, but we haven't seen any. We hear about droughts and crop failures, we don't know hunger. It has always been the others. It will be the others for a long time to come. We stand indecisively around the others and try desperately not to form too conspicuous a circle of gawkers, we are harmless, we are useless, we are above all in the way. (213)[168]

The use of the simple present perfect ("it has always been the other"), followed by the future tense ("it will be the others"), reinforces the idea that climate inequalities started in the past, are currently happening, and continue in the future. As spectators of both slow and fast violence, readers in the West are condemned to the paradox of their own actions and inaction when it comes to such inequalities.

Even when the novel shifts from Katt's perspective of a collective 'we' to a third-person 'they,' the paradox of action and inaction continues to inform the text, creating the sense of an impossible present-past-future:

> The following year it's as if there had never been snow, the year after that as if there was nothing but snow, it's too much, it's too little, the middle no longer exists, they abolish the

[167] "Wir leben in einer Zeit, in der minütlich Geschichte geschrieben wird, und wir verpassen sie trotzdem jedes Mal um ein Haar." (213)
[168] "Wir lesen von Springfluten, gesehen haben wir keine. Wir hören von Dürren und Ernteausfällen, Hunger kennen wir nicht. Es sind immer die anderen gewesen. Es werden noch lange die anderen sein. Wir stehen unschlüssig um die anderen herum und versuchen krampfhaft, nicht allzu auffällig einen Kreis aus Gaffern zu bilden, wir sind harmlos, wir sind nutzlos, wir sind vor allem im Weg." (213)

> middle, *they*, who are not her: Leda, and none of the others either and yet it was *them*, all of them together, every day it will have been them that they let pass and don't change, because they don't know how to do it, because they don't know what one person alone can do, because they become discouraged, and with every day their guilt grows greater and their courage smaller. (66; emphasis in the text)[169]

The mix of temporal and spatial language (seasons vs. the idea of a middle) underscores the fact that the climate crisis does not comply with the logic of human timeframes. Moreover, the use of the third-person plural to assign blame for imbalances in weather patterns highlights the absence of a single culprit. It contrasts the collective 'we,' which appears as the driving force behind specific destructive behaviours and contributes to a sense of guilt. Using 'they' creates distance and an outside perspective. By not specifying who 'they' are, the text emphasizes the difficulty of connecting climate change's temporal progression to one root cause or responsible group. This example shows particularly well the novel's formal experiment with narrative perspectives and voices to map out the complex and paradoxical elements of climate change as a crisis of the now.

While this sense of urgency, despair and powerlessness is typical of climate fiction, the novel also imagines alternatives. Narrating the marsh challenges apocalyptic scenarios that feature prominently in cli-fi and revolve around human survival and timelines. A constantly transforming ecosystem of water and land, the marsh resists anthropocentric framing of temporality and agency. When Leda first arrives in the salt marsh, she is fascinated by this abandoned land that bears traces of human pasts but continues to exist without humans. She first uses largely human-centred terms to describe place memory and history:

[169] "Im Jahr darauf ist es, als hätte es nie Schnee gegeben, im Jahr darauf, als gäbe es nichts anderes als Schnee, es ist zu viel, es ist zu wenig, die Mitte gibt es nicht mehr, die Mitte schaffen sie ab, *sie*, die nicht sie ist: Leda, und auch keiner der anderen und doch sind *sie* es gewesen, sie alle zusammen, jeden Tag werden *sie* es gewesen sein, den sie verstreichen lassen und nicht ändern, weil sie nicht wissen, wie es geht, weil sie nicht wissen, was einer alleine ausrichten kann, weil sie mutlos werden, und mit jedem Tag wird ihre Schuld größer und der Mut kleiner… " (66)

> The marshland that Leda saw had its memory and its history, for sure, but they had been forgotten, painted over with the black tar color that peeled off the outside walls of the houses like burnt skin, leaving white sensitive spots in the masonry where the salt and moisture soaked in. There was no chronicle of the people. No one had remained to preserve them. What Leda saw was an unoccupied land that could be taken, and a new chronicle of events that she would invent as it suited her. What Leda saw was nothing, and a lot of it: so much of it that you could grab it with both hands. Nothingness had never looked more like something. It promised Leda nothing less than: everything. (25)[170]

Leda perceives the marsh as a blank space for starting anew with the possibility of a better future for her and her son. However, the marsh rejects these anthropocentric notions of a "chronicle of the people" or a "chronicle of events." The marsh's (hi)story does not follow the model of linear, sequential events. But because of this, humans have viewed it as an empty place, a 'nothingness' that can be exploited at will, paved over, drained, and terraformed in so many ways.

As Leda realizes that the marsh is not empty, that it exists separately from human understandings of keeping time and recorded history, she begins to question anthropocentric notions of the future, such as the link between motherhood and futurity:

> "The world starts all over again with every child," she was told twelve years ago. They had meant it kindly. An encouragement. On the days when the salt in the meadows makes everything brighter, Leda can burst out laughing. That the world statistically starts over eighty thousand times every day, that everything starts from scratch and always runs the same. The love that never ends, and the work that fulfills, and the freedom to do anything and be anywhere, and the happiness that comes from the sum of these three, if you don't mess up, if you just add them up correctly, and all the other promises that stick people's mouths shut [...] It's as if we're just programmed that way. You can't do anything about it. Certainly nothing better. Two thousand years' time to figure it out, and the course of the world still bumbles along in the same places every time, the record is skipping, *Seems like folks turn into things/that they'd wa-a-a-a-a-a-a-n-n-n-n-t-t-t-t.* Leda can laugh at this, roll

[170] "Das Marschland, das Leda sah, hatte seine Erinnerung und seine Geschichte, ganz sicher, aber sie waren vergessen worden, überstrichen mit der schwarzen Teerfarbe, die sich von den Außenwänden der Häuser schälte wie verbrannte Haut und weiße empfindliche Stellen im Gemäuer zurückließ, in die das Salz und die Feuchtigkeit einzogen. Es gab keine Chronik der Menschen. Es war niemand geblieben, um sie zu bewahren. Was Leda sah, war ein unbesetztes Land, das man einnehmen konnte, und eine neue Chronik der Ereignisse, die sie erfinden würde, wie sie ihr passte. Was Leda sah, war nichts, und viel davon: so viel davon, dass man es mit beiden Händen greifen konnte. Nie hatte das Nichts mehr nach etwas ausgesehen. Es versprach Leda nicht weniger als: alles." (25)

> around on the floor. Laugh herself to death. (How nice that would be, Leda thinks. But this end was finally over with the child). (42-43)[171]

Leda knows that the world does not start anew with a child. Being responsible for Zeno reminds her of the 'could have been futures' that are no longer possible and humanity's failure to stop "eating the future" (125) of the next generations. Unable to deal with feelings of guilt, she leaves Zeno.

So what is left of human temporality when the vision of the present is no longer built on a parent-child continuity? In Leda's case, it is necessary to completely redefine the role of a mother. Her task is no longer to best prepare her child for surviving climate change futures, but instead to break with all possible legacies or heritages. The novel addresses the problem of generational justice and challenges "the framing of posterity as parenthood – not just the expression of environmental obligations as a matter of posterity but the alignment of these with the language and norms associated with parenthood" (Johns-Putra, *Climate Change and the Contemporary Novel* 6). Ruptures and endings characterize this new view of motherhood:

> When he understands how little we've left him, she thinks, her hand on the doorknob, he'll despise me, and if I'm lucky, he'll be brave. That would be the worst. I wish him anger. I wish he can whine like a dog, and feel sorry for himself, and curse me out loud, so at least he has something solid, a person, a person in charge, a thing to spit on. A good mother must be able to do three things. To sit out time. To lie. And to disappear at the right moment. (129)[172]

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[171] "Mit jedem Kind beginnt die Welt von vorn, hatte man ihr damals gesagt, damals vor zwölf Jahren. Man hatte das freundlich gemeint. Eine Aufmunterung. An den Tagen, wenn das Salz in den Wiesen alles heller werden lässt, kann Leda sich darüber ausschütten vor lachen. Dass die Welt statistisch jeden Tag achzigtausendmal von vorn beginnt, alles auf Null und es immer gleich läuft. Die Liebe, die nie endet, und die Arbeit, die erfüllt, und die Freiheit, alles zu tun und überall zu sein, und das Glück, das die Summe aus diesen dreien ergibt, wenn man nicht patzt, wenn man sie nur richtig zusammenrechnet, und all die anderen Versprechen, die den Menschen die Mäuler verkleben (…) Es ist, als wären wir einfach so programmiert. Man kann da nichts machen. Schon gar nichts besser. Zweitausend Jahre Zeit, es zu kapieren, und der Lauf der Welt eiert trotzdem jedes Mal an denselben Stellen, Platte gesprungen, *Seems like folks turn into things/that they'd wa-a-a-a-a-a-n-n-n-n-t-t-t-t*. Darüber kann Leda losprusten, sich auf dem Boden wälzen. Sich todlachen. (Wie schön das wäre, denkt Leda. Aber *dieses* Ende war mit dem Kind endgültig vorbei.) (42-43)"

[172] "Wenn er versteht, wie wenig wir ihm übrig gelassen haben, denkt sie, die Hand am Türknauf, wird er mich verachten, und wenn ich Glück habe, wird er tapfer sein. Das wäre das Schlimmste. Ich wünsche ihm Zorn. Ich wünsche ihm, dass er winseln kann wie ein Hund, und sich bemitleiden, und mich laut verfluchen, da hat er wenigstens

In the place of love, Leda wishes for her son a person to blame and to hate in the face of climate change realities. By disappearing when Zeno turns twelve, Leda breaks the cord of linear human futures (i.e., a sequence of generations). Readers get the sense that no futures are possible in this world of ruptured relationships and broken timelines. But this is not the only future imagined in the novel; the 'no future' that results from past and present human behaviours is complicated by the multiple temporalities in the marsh.

II. Narrating marshy place-time

In den Marschen ist die Zukunft eine Schicht der Gegenwart. (291)
In the marshes, the future is a layer of the present. (291)

In descriptions of the salt marsh ecosystem, the novel questions the linear progression of the future and articulates alternative, non-anthropocentric temporalities. Human time and non-human times are intertwined in the marsh. However, the text zooms in on the ways in which the marsh is telling its own story (independently from the human) as layers of temporality work to blur our distinction between the future and the present. These alternative temporalities emerge in the observations of Katt, the female character who dominates the narrative after Leda's disappearance. As she states, "in the marshes, the future is a layer of the present" (291).[173]

To challenge normative understandings of linear time, the novel first describes the marsh as a place that resists conventional, human ways of navigating terrain and mapping locations. Moving through an environment that "does not cater to established, classical concepts of vista,

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etwas Handfestes, eine Person, eine Verantwortliche, ein Ding, auf das man spucken kann. Eine gute Mutter muss drei Dinge können. Zeit absitzen. Lügen. Und im richtigen Moment verschwinden." (129)

[173] "In den Marschen ist die Zukunft eine Schicht der Gegenwart." (291)

horizon, and landscape (Fritzell, cited in Howarth, p. 510), humans accept the loss of usual points of orientation. Landscape is constantly changing in the marsh as Katt notes:

> As soon as I create a map of silt and sand, grasses and stones and tide line, I get lost in it. […] The more you try to get an overview or try to wrest something lasting from the arbitrariness of the changes in the ground caused by wind, tide, the hundreds of tiny holes in the ground above the passage systems of the tide worms, the intended tracks of curlews, gulls, and oystercatcher beaks, the more confused you are left. (275-276)[174]

There is no 'lasting' in a place where the ground never has the same form. In other words, time cannot be constructed as some abstract, quantifiable unit; it is co-dependent on the environmental conditions of place.

Described as "neither beautiful nor exciting, not even idyllic" (293)[175], the marsh resists additional forms of human knowledge, place, and time constructions. First and foremost, it is known by what it is not: a "land that had no name of its own features worth naming, not fallow and not industrial, not wild and not cultivated" (66).[176] "The land of salt" that "does not know what it wants to be," "not land nor sea," and "where plants are neither wet nor dry, between seaweed and stalk, all half-natures, not quite at home in any element" (54), the marsh cannot be known or imagined as a whole. The lack of positive characteristics means allowing the marsh to exist outside of human frameworks and categories.

This does not mean that the novel always describes the marsh in terms that are negated. But it resists listing a set of fixed characteristics and instead outlines the marsh in terms of its

[174] "Sobald ich versuche, eine Karte von Schluff und Sand, Gräsern und Steinen und Flutlinie anzulegen, verlaufe ich mich darin [...] Je mehr man sich um einen Überblick bemüht oder versucht, der Willkür der Veränderungen im Boden durch Wind, Flut, die Hunderte winziger Bodenlöcher über den Gangsystemen der Prielwürmer, den eingedrückten Spuren der Brachvögel, Möwen und Austernfischerschnäbel etwas Bleibendes abzutrotzen, desto verwirrter bleibt man zurück." (275-276)

[175] "Die Marschen sind weder schön noch aufregend, nicht einmal idyllisch" (293)

[176] "…das Land überging, das keinen eigenen Namen hatte und keine Eigenschaften, die sich eigens zu benennen gelohnt hätten, nicht Brache und nicht Industrie, nicht wild und nicht bewirtschaftet." (66)

relations and effects: “just bristly hard plants that crawled close to the ground and scratched your legs” (66).[177] Moreover, by pointing to the agency of plants that ‘crawl’ and ‘scratch,’ the novel highlights individual lives as telling their story in the marsh. A powerful web of vegetal relations emerges in the text:

> It's difficult for the plants on this land: the never-ending sanding of the wind from the sound, the floods from the river, the summer droughts, the hard salty soil. Only spicy radishes thrive here, and the sea kale shoots up at any time of the year, beating the stiff blue braids of its leaves with the direction of the storms and not against them, greedily sucking up brackish salt water when the tide rolls out over the marshes and rises up to the neck. Now, in early summer, the sea kale reaches Zeno's waist, no one has harvested it. (29)[178]

This focus on the plants’ mechanisms of resilience affirms how they have adapted to the harsh conditions in a climate-changed environment that is dominated by floods and droughts and an imbalance of salt and water. As Zeno observes the “tricks” that the marsh plants develop to survive, the text reveals a force of life in the marsh that has no need of humans: “The salt aster pumps the salt of the tide into old leaves and sheds them, milkweed grows hairs just to store the salt. The salt lilac spits out half of its name in disgust, its salt glands work day and night, summer and winter” (256).[179] Naming each type of plant reminds the readers of specific responses to highly saline soils and the struggles of living in such a hostile environment.

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[177] “…nur borstige harte Gewächse, die nah über den Boden krochen und einem die Beine zerkratzten.” (66)

[178] “Es ist schwierig für die Pflanzen auf diesem Land: das nie aussetzende Schleifen des Windes vom Sund, die Hochwasser vom Fluss, die Sommerdürren, der harte salzige Boden. Nur scharfer Rettich gedeiht hier, und der Meerkohl schießt ins Kraut zu jeder Zeit des Jahres, schlägt die steifen blauen Borten seiner Blätter mit der Richtung der Stürme und nicht dagegen und saugt sich gierig mit brackigem Salzwasser voll, wenn die Flut über die Marschen hinausrollt und bis zum Hals steigt. Jetzt im Frühsommer reicht der Meerkohl Zeno bis zur Hüfte, niemand hat ihn geerntet.” (29)

[179] “Die Salzaster pumpt das Salz der Flut in alte Blätter und stößt sie ab, Milchkraut lässt sich Haare wachsen, nur um das Salz darin zu lagern. Der Salzflieder spuckt die Hälfte seines Namen angewidert aus, seine Salzdrüßen arbeiten Tag und Nacht, sommers wie winters.” (256)

The interplay between salt and vegetation contributes to a sense of marsh place-time that is cyclical and shaped by other-than-human dynamics at play in this environment. A constant force in the marsh, salt eats, gnaws into, bites, and tears at the plants, affecting their temporal patterns of growth and decay:

> The salt doesn't preserve the dead sea fennel, it eats away at it, gnawing into its leaf fibers with splintery salt teeth, biting and tearing the leaf tissue, corroding the rest: there is a whole autumn forest in the marshes this May, it turns color, it dies, then it grows anew. (255)[180]

Irregular weather patterns create new seasons, such as autumn in May, and affect the vegetal cycle of growth and decay. Moreover, the text presents plant life as following slower temporalities and shifts focus to non-temporal elements like sound and colour:

> Even sand is not silent. It hisses and roars in storms and saws in the wind as piercingly as the crickets that sit on the lower stalks of the Andel grass and chirp with serious brown faces. It bakes humming in the heat and pops up bright and dry in the heavy sticky clover soils of the marsh in the summer heat. Even a mulberry makes a sound as it becomes ripe. One can hear its green-skinned tones, its dark red, its rotten black tones. One just has to sit in front of the mulberries for a very long time, because the sounds are very slow, long-lasting, and are best heard when the sounds change, which can take weeks, depending on the weather. The darker the berries become, the deeper the tones become. The riper the mulberries become, the further their sounds travel across the land and attract the starlings. (100)[181]

[180] "Das Salz konserviert den toten Meerfenchel nicht, es frisst an ihm, nagt sich mit splittrigen Salzzähnchen hinein in seine Blattfasern, zerbeißt und zerreißt das Blattgewebe, verätzt das Übrige: einen ganzen Herbstwald gibt es in den Marschen in diesem Mai, er färbt sich, er stirbt, dann wächst er von Neuem." (255)

[181] "Selbst Sand ist nicht stumm. Er faucht und braust bei Sturm und sägt bei Wind so durchdringend wie die Grillen, die an den unteren Halmen des Andelgrases sitzen und mit ernsten braunen Gesichtern zirpen. Er backt summend in der Hitze und springt in den schweren klebrigen Kleiböden der Marsch in der Sommerhitze hell und trocken auf. Selbst eine Maulbeere macht Geräusche beim Reifen. Man kann ihre grünschaligen Töne hören, ihre dunkelroten, ihre faulschwarzen Töne. Man muss dafür nur sehr lange vor den Maulbeeren sitzen bleiben, denn es sind sehr langsame Töne, langanhaltend, am besten hört man sie, wenn die Töne wechseln, das kann Wochen dauern, je nach Wetterlage. Je dunkler die Beeren werden, desto tiefer werden die Töne. Je reifer die Maulbeeren werden, desto weiter klingen ihre Geräusche über das Land und locken die Stare." (100)

Describing such a rich soundscape, the novel imagines the marsh from a relational, multispecies perspective (e.g. sand, storms, grass, crickets).

This de-anthropocentric agency can also be seen in a long description of river mists, a type of meteorological phenomenon that resists being captured, contained, and controlled, much like other forms of water. As an oversaturated place-time, the marsh extends beyond its watery edges, reaching into the land:

> It's a day without sun. The river mists do not lift. They simmer through the marshes, gather around the canvas tents, cloud the salt that the tide and wind carry into the meadows and pull over the tents on the shore, salt and water creep deep into every fiber and wear down the canvas. The mist travels to the cliff and the strait and crumples over the opening of the sound out to the open sea like absorbent cotton from a torn open doll. The mists weave themselves around the whole land that they call *Öde Speiche* and that clings to the *Blanke Elle* like a skinny arm bone, they weave themselves through the pines and black alders and walnut branches and wind-dried rotten fruit on the mulberry trees, they fill the empty basins of the salt gardens, they gather around the salt works, the main house, the salt mine, where salt is no longer stored. (23)[182]

The movements and behaviour of the mists are storied in a linear way, yet they do not constitute 'a chronicle of events.' Readers follow the tiny droplets of river water hanging in the air through a series of active verbs like simmering, gathering, creeping, travelling, or weaving. In addition, the land is referred to as "Öde Speiche," ('bare spoke bone') and the river "Blanke Elle," ('bare ulna') as if it had the anatomy of a human body. Yet, this anthropomorphism does not transform the land into a human figure because the text "make[s] visible" (Latour 12) the shape of the river and tries to capture how it constantly changes form. It does not separate non-human and human actions but

[182] "Es ist ein Tag ohne Sonne. Die Flussnebel lichten sich nicht. Sie simmern durch die Marschen, lagern sich um die Zeltbahnen, umwolken das Salz, das Flut und Wind in die Wiesen tragen und über die Zelte am Ufer ziehen, Salz und Wasser kriechen tief in jede Faser und machen Leinen mürbe. Die Nebel wandern bis zur Klippe und zum Sund und knüllen sich über die Öffnung des Sunds hinaus aufs offene Meer wie Watte aus einer aufgerissenen Puppe. Die Nebel flechten sich um das ganze Land herum, dass sie Öde Speiche nennen und das sich wie ein dürrer Armknochen an die Blanke Elle schmiegt, sie flechten sich durch die Föhren und Schwarzerlen und Wallnussbaumzweige und windgetrockneten Faulfrüchte an den Maulbeerbäumen, sie füllen sich in die leeren Becken der Salzgärten, sie sammeln sich um die Saline, das Haupthaus, das Salzlager, in dem kein Salz mehr lagert." (23)

explores the "morphisms" in the marsh and the ways in which the mists "gather around" human constructions that have changed function.[183]

Taking on many forms, water challenges the idea of a single type of agency. As a river, it moves following its own rhythms: in ice form, it expands and contracts; in mist form, it "simmers" and "creeps." The novel connects these physical changes to the idea of passing time:

> The day, on which the river rises to the house comes creeping over the land on silent feet, at first hardly seems to advance, the mechanics of passing time lags, as always during extreme weather, it stretches in the heat and contracts so much on the cold edge of this February that Time falls out of its glide and becomes stagnant matter like the ice around the withered tufts of river grass, stops. (92)

In this passage, time becomes matter. Terms like "day" no longer map onto a numerical number of hours and are instead used to describe material comparisons or sensations. Climate change events like floods and rising water levels require language that understands time as a physical force with very concrete effects as when the river slowly inundates Leda's house: "…when the present bulges the walls of the house inwards like a curtain and the now rises up the bedposts like a flood and Leda can no longer get up without getting her feet wet." (118)[184]

Water transforms the marsh soil into "a trickster" where "you step onto solid and sink immediately" (276).[185] While the water erases traces on the marsh's surface, the soil absorbs the humidity. Erasure and continuity, permanence and impermanence are interlinked as place-time in the marsh. Once again, it is Katt who reflects on the ambiguities of life in the marsh, in this case, on the absence of fixed time and place:

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[183] Moreover, the focus on the various shapes the river takes slows down the text's pacing, which creates another non-human temporal layer.

[184] "…wenn die Gegenwart die Wände des Hauses nach innen bauscht wie einen Vorhang und das Jetzt an den Bettpfosten hochsteigt wie ein Hochwasser und Leda nicht mehr aufstehen kann, ohne sich nasse Füße zu holen." (118)

[185] "Der Boden in der Marsch ist ein Trickbetrüger. Man betritt festen Sand und sinkt sofort." (276)

> There is no permanence here, except that the non-permanence returns in exactly the same rhythm every day. Not even my feet, my pacing and my thinking, when I walk along the river in the mornings without a destination, have to decide. Nothing is ever fixed. If I make tracks in the sand in the morning, the evening has erased them. In the marshes, everything can be taken back. I am here - and yet I am not. I take myself back like a clumsy word in a conversation. Walking in the marshes is like stepping on fresh snow every day, without history and light, like every beginning, only you can't get beyond the beginning: human and river don't recognize each other. (281)[186]

Humans want to remember where they have been, to put down roots, to leave traces of their existence, to transform landscape into an archive of their stories so that future generations can know of their existence. Non-human marsh place-time works in forgetting futures, destabilizing the self and a notion of 'coming from' a place.

Even if the marsh completely erases human traces at its surfaces, it can also work to preserve human objects in its depths for extended periods of time. Both empty slate and archive, the marsh land has its own ways of keeping time and memory in place.

> The centuries that have stood one after the other around the riverbank and dumped their waste into the river, the mud of the *Blanke Elle* traps them like amber, a bubble without oxygen or time. The soles of shoes that have slept in the mud for five hundred years, she shows Zeno the indented places, you can still see the foot, there it is, five grooves in the leather, five toes that have survived half a millennium, an eternal step, frozen by the river while walking, Zeno reverently traces the grooves, the next day the leather has disintegrated into slippery crumbs. (56)[187]

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[186] "Es gibt hier keine Permanenz, außer dass die Nichtpermanenz in einem genau gleichen Rhythmus täglich wiederkehrt. Nicht einmal meine Füße, mein Schrittmaß und mein Denkmaß, wenn ich an den Vormittagen ohne Ziel am Fluss entlanglaufe, müssen sich entscheiden. Nichts ist je festgeschrieben. Wenn ich morgens Spuren in den Sand setze, hat der Abend sie ausgelöscht. In den Marschen lässt sich alles zurücknehmen. Ich bin hier - und doch nicht. Ich nehme mich selbst zurück wie ein ungeschicktes Wort in einer Unterhaltung. In den Marschen laufen ist wie jeden Tag auf frischen Schnee treten, geschichtslos und leicht, wie jeder Anfang, nut kommt man über den Anfang nicht hinaus: Zwischen Mensch und Fluss gibt es kein Wiedererkennen." (281)

[187] "Die Jahrhunderte, die nacheinander um das Ufer herumgestanden und ihren Abfall in den Fluss gekippt haben, schließt der Schlamm der Blanken Elle ein wie Bernstein, eine Blase ohne Sauerstoff und Zeit. Schuhsolen, die fünfhundert Jahre im Schlamm geschlafen haben, sie zeigt Zeno die eingedrückten Stellen, man sieht den Fuß noch, da ist er, fünf Rillen im Leder, fünf Zehen, die ein halbes Jahrtausend überlebt haben, ein ewiger Schritt, vom Fluss im Gehen eingefroren, Zeno fährt andächtig die Rillen nach, am nächsten Tag ist das Leder in Glitsch und Brösel zerfallen." (56)

Once well-preserved human objects are brought to the surface, they quickly disintegrate because of exposure to the air. What has been preserved for five hundred years disappears in a day. Yet the marsh has no 'concept' of such human-constructed time. It is a place that layers time or, where time is always place-dependent and vice versa.

The marsh's place-time points more generally to the novel's unravelling of paradigms of order, separation, taxonomies, and its constant disordering of orientation points. The marsh is both a place of un-remembering and a place of preservation, a place of non-existence and constant ebb and flow. Zooming out from the marsh to the entire planet, the novel imagines such contradictions at the heart of human and non-human ways of making meaning:

> Every square centimeter of earth is covered with a mesh of memories and stories, it covers the stones and the people, and both are ever denser, with every year there are more stones and more people, stones and people move closer together to make room for those who come after, the little space where there was nothing before: Nothing, that once existed, that was the main part of the world. Because nothing was nothing and therefore meant nothing, there was no need to worry about nothing. Its existence, or rather non-existence, was not important. Nothingness did not exist and therefore did not need to be preserved. You didn't have to worry about anything. It was that which was and came to be that caused trouble. Until the nothingness had almost completely disappeared from the soils, and with the disappearance of the gaps between something in which the nothingness had sat peacefully, the trouble really began to grow, black weeds that fed on what was now to be found on and in the soils instead of the nothingness: narrowness and waste and memory. (24-25)[188]

Such a long passage in the past tense might first suggest a construction of historical time. But the constant contradictions and paradoxes within the description once again challenge such a reading.

[188] "Jeder Quadratzentimer Erde ist überzogen mit einer Flechte aus Erinnerung und Geschichten, sie bedeckt die Steine und die Menschen, und beide stehen immer dichter, mit jedem Jahr gibt es mehr Steine und mehr Menschen, rücken Steine und Menschen enger zusammen, um denen, die nachkommen, Platz zu machen, den wenigen Platz, wo vorher nichts gewesen ist: Nichts, das gab es einmal, das war der hauptsächliche Anteil an der Welt. Weil das Nichts ja nichts war und also nichts bedeutete, musste man sich um das Nichts nicht kümmern. Seine Existenz oder besser: Nichtexistenz war nicht wichtig. Das Nichts war nicht und musste also nicht erhalten werden. Um nichts muss man sich nicht kümmern. Das, was war und dazukam, war es, was Scherereien machte. Bis das Nichts fast ganz von den Böden verschwunden war, und mit dem Verschwinden der Lücken zwischen etwas, in denen das Nichts friedlich gesessen hatte, die Scherereien erst richtig zu wuchern begannen, schwarzes Unkraut, das sich von dem ernährte, was nun statt dem Nichts auf und in den Böden zu finden war: Enge und Abfall und Erinnerung." (24-25)

The marsh is referred to as "nothingness" to highlight its existence independent of and long before humans and to emphasize that it does not comply with human notions of time. "Covered with a mesh of memories and stories" while at the same time resisting these forms of meaning-making as "the little space where there was nothing before," the marsh is presented as a place that is always linked to multiple ways of keeping time. The passage grapples with the idea that the marsh story ultimately escapes the realm of human language because, as "nothingness," it cannot be contained by human acts of interpretation. Humans are represented metaphorically as 'black weeds' that exist in the present 'now' of the marsh, replacing the 'nothingness' with their own "narrowness and waste and memory."

The marsh combines seemingly contradictory ideas of permanence and impermanence, water and land, and here and nowhere. This allows the imagination of a topological time that is expressed in non-linear terms as both present and future. This indistinctiveness of the marsh makes it a "confusingly incongruous" (293)[189] terrain that undermines thinking in fixed categories. At the same time, readers are able to recognize the marsh as a place affected by climate change where familiar elements of cyclical time continue to exist: "The next night, the temperatures drop. The weather takes back the premature warmth like a demand, deprives the land of its advance of delicate colors, makes the river pale. The next morning it lies under a layer of ashen gray ice" (128).[190] The linear continuity of a 'next' day followed by a 'next' night is disrupted by the extreme weather patterns that sunder proximate places.

[189] "Etwas an diesem Gelände ist verwirrend unstimmig…" (291)
[190] "In der nächsten Nacht brechen die Temperaturen ein. Das Wetter nimmt die vorzeitige Wärme zurück wie eine Forderung, entzieht dem Land den Vorschuss an zarten Farben, macht den Fluss fahl. Am nächsten Morgen liegt er unter einer aschgrauen Schicht Eis." (128)

III. *Miracles* as critically hopeful cli-fi

Ich habe keinerlei Anlass, an etwas zu glauben, das weiter entfernt ist als morgen. [...] Ich glaube an Zukunft in einem sinnlosen, hartnäckigen Reflex, wie ein Bein, wenn man auf den Knienerv schlägt, immer austreten wird: in die Luft, ins Leere. (394)

I have no reason to believe in anything further away than tomorrow. I believe in the future in a senseless, stubborn reflex, the way a leg will always kick out when you hit your knee nerve: into the air, into the void. (394)

For humans, hope is a future-oriented sentiment and is often tied to anthropocentric ideas of survival and progress. This presents a challenge to cli-fi as it responds to a crisis that "radically re-writes the future of humanity and therefore alters the relationship humans have with the future" (Herr 88). This future is often bound to a present during which humans have altered and damaged global ecosystems and living systems and continue to do so. Trexler points out that "the most common strategy of climate change novels is to describe contemporary inertia as a catastrophic miscalculation of climate change's costs," and that some cli-fi novels are "directed at the reader's sense of the future costs of present emissions" (*Anthropocene Fictions* 120). In such scenarios, there appears to be little hope. Emphasis is placed on miscalculations and costs. How, then, can cli-fi be hopeful?

While there is no one single answer to this question, hope can emerge when a cli-fi novel attempts to convince readers to change their current behaviour and to live more sustainably. There is hope in the change that will follow from a realization of the impossibility of present ways of living that will inevitably lead to the future we must avoid. In *Miracles*, such a linearity of past, present, and future cannot describe the realities of climate change. There is no 'hopeful' understanding of human behaviours that will necessarily change in the future. Instead, hope emerges through an attempt to 'unknow' the future as a logical continuation of the present moment.

Despite this call to 'unknow' futures, human characters in the novel still cling to linear temporalities as some kind of automatic reflex to the difficult realities of a climate-changed reality. Living in the marsh, Katt explains:

> I have no reason to believe in anything further away than tomorrow. I don't owe anyone anything, especially not the day after tomorrow, not next week. But I just can't let it go. I would never say it out loud. I believe in the future in a senseless, stubborn reflex, the way a leg will always kick out when you hit your knee nerve: into the air, into the void. (394)[191]

Describing our attachment to a linear future as a "stubborn reflex," the novel emphasizes the challenge of undoing or troubling our sense of future times. To imagine this process of undoing, Stahlmann's writing multiplies human and non-human temporalities, ways of remembering and forgetting, forms of disappearing and reappearing. (i.e., generational, cyclical, historical, non-human).

It is in this way that the novel creates a sense of critical hope that can be defined as a space "where feared and desired future outcomes exist side by side, and even our all too human hope for a better future is critiqued" (Thaler 172) as a "working not for a return to the world as it was but for a way to live meaningfully through what remains" (Thaler 164). The novel does not long for a better present, as it acknowledges the threshold of climate change as already past. Asking how we can have hope when the past cannot be restored due to irreversible environmental damage and imagining seemingly opposing or contradicting ideas side-by-side is essential for the novel's critical sense of hope. Moreover, the novel does not place hope in the figure of the child who carries on human existence. On the one hand, Zeno does help the marsh community create a

[191] "Ich habe keinerlei Anlass, an etwas zu glauben, das weiter entfernt ist als morgen. Ich bin niemandem etwas schuldig, schon gar kein Übermorgen, keine nächste Woche. Aber ich kann es einfach nicht lassen. Ich würde es niemlas laut sagen. Ich glaube an Zukunft in einem sinnlosen, hartnäckigen Reflex, wie ein Bein, wenn man auf den Knienerv schlägt, immer austreten wird: in die Luft, ins Leere." (394)

'livable' present by gathering a community together, by illustrating experience and knowledge of the plants in the marsh. On the other hand, when he dies in a wildfire, readers are reminded of the harsh realities of climate change that is happening now. The child can no longer function as a symbol of continuity in this climate change novel. Instead, Zeno reminds the readers of the incalculable losses that must be grieved in a climate-changed world. Within this novel, critical hope emerges as a process of grieving, adapting to, and accepting impermanence.

Asking what remains and what changes in a climate-changed future-present, the text blends temporalities and imagines 'the future' in new contradictory ways that move beyond anthropocentric categories:

> The future is no longer straight ahead, it's not behind us, walking beside us, it's under our feet, it's like when the walnuts are ripe, we pick them from the trees with sharpened eyes, it could be that we find white meat, fat and riches, it could be that we come up empty: We must get along without a sure promise, we grasp at probabilities, we peel them from the firm green skins, it will be enough for us. (396)[192]

The passage evokes the imagery of non-human temporalities (i.e., walnuts becoming ripe) and uses spatial language to articulate how the marsh's present-future complicates and contradicts human temporalities. To imagine what this present-future means for the humans living in the marsh, the novel comes back to a collective 'we.' However, the tone of this 'we' differs from the political voice at the beginning and articulates how the experience of living in the marsh has changed Katt's perspective. The marsh anchors her in the present moment, allowing her to situate this 'we' within the marsh's place-time, while also opening up multiple possibilities through the use of the conditional ('it could be... it could be'). Nothing is sure in the marsh, especially not

[192] "Die Zukunft liegt nicht mehr geradeaus, sie liegt nicht hinter uns, geht neben uns her, ist unter unseren Füßen, es ist, wie wenn die Walnüsse reif sind, wir pflücken sie mit geschärften Augen von den Bäumen, es könnte sein, dass wir weißes Fleisch finden, Fett und Reichtum, es könnte sein, dass wir leer ausgehen: Wir müssen ohne eine sichere Zusage auskommen, wir greifen nach Wahrscheinlichkeiten, wir schälen sie aus den festen grünen Häuten, es wird uns genügen." (396)

anthropocentric futures based on human survival expressed by the earlier Western 'we.' Moreover, by placing humans in the marsh's multiple time-places, the novel counters fears of human extinction and reveals other non-human forms of memory and archive. Katt begins to question whether memory exists at all: "I can't really remember anything, neither of us in the salt works nor of myself in other places. There is no such thing as real memory. Real memory is never possible." (347)[193] Being in the marsh blurs or 'frays' timelines, making 'memory' relative to where one is located and questioning whether humans need to be remembered at all. Even if the novel radically challenges linear temporality and the possibility of a human future, it does not leave its readers with a sense of despair. On the contrary, it points to the marsh as the creator of storied time-places that complexify and nuance attempts to historicize and remember current climate-changed realities.

Disentangled from linear temporality, hope is bound up in present meaning-making processes. As Katt watches Zeno dying, she tells him the story of "the last light" in Venice where "the churches are still open, they're open until the end, the music plays on" (387), which emphasizes human creativity as a way of coping with loss and uncertainty. Telling stories helps Katt to grieve Zeno's death, but also to work through environmental loss and decline, and create a sense of community:

> As long as we speak, we still exist, our language carries us out of our heads and into our bodies, it is everywhere where something flows - a blood, where something beats - a pulse, and where there is a stream, we can camp, and where there are drums, we will sit in a circle and tell each other, there must never be no language. (398)[194]

[193] "Ich kann mich an nichts wirklich erinnern, weder an uns in der Saline noch an mich selbst an anderen Orten. Echte Erinnerung gibt es nicht. Echte Erinnerung ist niemals möglich." (347)

[194] "Solange wir sprechen, gibt es uns noch, unsere Sprache trägt uns aus unseren Köpfen und in unsere Körper, sie ist überall dort, wo etwas fließt — ein Blut, wo etwas klopft — ein Puls, und wo es einen Strom gibt, können wir zelten, und wo es Trommeln gibt, werden wir im Kreis sitzen und uns erzählen, es darf nie keine Sprache geben." (398)

Here the collective 'we' seems to reference a much larger human community, one that began with the use of language and one that will continue to exist as long as languages exist. Evoking such a mythical past-future time of drums beating and bodies dancing might at first seem to contradict the novel's refusal of a single narrative to tell human and non-human stories. Yet, myth cannot be circumscribed in historical, linear time. It circulates like the blood 'where something beats;' it cycles like the circle in which humans tell stories.

At the same time, the novel's critical hope does not rely solely on human ways of using language and telling stories. As I have already explained, the marsh is telling its stories using its own time-places. In her reflections more generally about non-human stories, Leda wonders:

> [Whether] a child needs four seasons and a future; whether the future has not always been in an unknown writing system that a woman and a child have not been able to read, and that one can look at its signs like black senseless beautiful ornaments of ice, of wind, of water, of dust that swirls up and settles in the eyes like sleeping sand, fine and soft and comforting. (66)[195]

Non-human elements that form an "unknown writing system" replace the temporal markers that humans hold onto, such as the birth of a child or the recurrence of stable seasonal patterns. Here, the text points to the broader question it grapples with: How can we make sense of, write about, 'read,' visualize, and grasp future times when humanity will be extinct, and nobody will be left to read and interpret our stories and archives? Human language may be simply one avenue of coping and coming to terms with an unknowable future.

Moreover, the novel upholds the appeal of language as a response to the paradoxical nature of a climate-changed future that is already unfolding and marked by "the kind of uncertainty

[195] "…ob ein Kind vier Jahreszeiten braucht und eine Zukunft; ob die Zukunft nicht schon immer in einem unbekannten Schriftsystem gelegen hat, das eine Frau und ein Kind nicht haben lesen können, und dass man ihre Zeichen betrachten kann wie schwarze sinnlose schöne Ornamente aus Eis, aus Wind, aus Wasser, aus Staub, der aufwirbelt und sich in die Augen setzt wie Schlafsand, fein und weich und tröstlich." (66)

humanity cannot solve through measurement or rationality" (Herr 88) through imagery. On many occasions, Stahlmann's writing uses poetic language to paint a picture rather than follow a sequential narrative. This is very much in line with the way in which the author herself describes how she aims to create "Sprachbilder"/'language-images' (Stahlmann, interview) in which readers can immerse themselves. If I have included many longer quotes in this chapter, it is to illustrate the incredible richness of such language-images that combine non-human and human ways of experiencing and relating to the world. For example, Katt describes futures through the imagery of "the firm green skins" (396) of ripe walnuts that continue to grow. Readers imagine nature's resilience and the continued existence of life on earth. But then the novel outlines a very different language-image of the future:

> Tomorrow was a sleepy crumbly matter floating in the flood above as fodder for the ducks that gave tinder to the flames in the fires. The day after tomorrow was unlikely. The land was parched in summer and under water in winter. The cities were nests of stone where mammals died patiently. We were half weather, half animal. (168-169)[196]

Faced with a climate-changed reality, readers have to re-imagine a world of constantly changing forms in which categories like human and non-human, time and matter, animal, plant and mineral no longer hold. Critical hope lies not in the singularity of a human future – 'the day after tomorrow was unlikely' – but in the capacity of language-images to surprise, trouble, disorient, and disturb readers who will already have been 'half weather, half animal.'

IV. Conclusion: Stories and Miracles

[196] "Morgen war eine schläfrige krümelige Materie, die im Hochwasser schwamm oben als Futter für die Enten, die in den Bränden dem Feuer Zunder gab. Übermorgen war unwahrscheinlich. Das Land war ausgetrocknet im Sommer und unter Wasser im Winter. Die Städte waren Nester aus Stein, in denen Säugetiere geduldig starben. Wir waren zur Hälfte Wetter, zur Hälfte Tier." (168-169)

Ich habe die Vermutung, dass eine Geschichte auf ganz ähnliche Weise entsteht wie ein Geist, etwas mit Zufall und Salz, ein bisschen Schweiß, ein bisschen Träne, und dem Schweben zwischen einem Boden und einem Himmel. (162)

I have a hunch that a story is created in a very similar way to a ghost, something with coincidence and salt, a little sweat, a little tear, and floating between a ground and a sky (162)

Erfindet mir die mickrigen nebensächlichen Wahrheiten, die uns passiert sind in jedem Jahr. Diese ganzen belanglosen Wunder. (162)

Invent for me the puny trivial truths that happened to us each year. All these petty miracles. (162)

What exactly is an "accidental novel of hope"? (novel's epigraph[197]). As I have shown in this chapter, it is a novel that situates critical hope in cli-fi within the space of the unexpected and serendipitous and counters a singular despairing view of a climate change future. The novel's title further illustrates the desire to remain hopeful despite a feeling of overwhelming powerlessness in the face of an unknown and unimaginable future. The pairing of the negatively connotated adjective 'petty' with the word 'miracles' maps out the novel's concern for the paradoxical elements of imagining the unimaginable. What exactly are these "petty miracles" in a climate-changed world? On the one hand, literature is a kind of petty miracle because it creates stories to cope with and make sense of the climate crisis, trying to hold on to what remains despite chaos and despair. On the other hand, literary storytelling is never enough as it remains bound to human language and human conceptions of time and place.

It is worth looking more closely at the use of the expression 'petty miracles' in the novel itself to better capture the nuances of the ways in which it articulates a kind of critical hope in cli-fi. In the passage below, Katt speaks directly to the readers, inviting them to participate in

[197] "Dies ist ein versehentlicher Hoffnungsroman."

collective storytelling and reminding them that they are reading a fictional story that is a construct of the imagination:

> It wasn't like that, it was never like that. Maybe it wasn't even anything like that. Without the others, there is only my story, my tongue is lonely. Please tell me your stories, tell them so that my story no longer feels alone: I have a hunch that a story is created in a very similar way to a ghost, something with coincidence and salt, a little sweat, a little tear, and floating between a ground and a sky. And invent everything that really happened and that I have forgotten so quickly: Invent for me the puny trivial truths that happened to us each year. All these petty miracles. (162)[198]

Once again, the flow of the passage is disrupted by a language-image that requires a slower form of interruption and reading. 'Coincidence,' 'salt,' 'sweat,' 'tear,' and an in-between space are the ingredients of that which cannot be contained, explained, or fully materialized. Stories, like ghosts, are not human nor non-human; they are both and neither. On the one hand, they can reveal 'truths' as little kernels of remembering and materializing. On the other hand, they are a miracle, that is, a "marvellous event not ascribable to human […] agency" (Oxford English Dictionary), and so they defy the framework of truth. Critical hope lies then in the story not as a vision of a global solution to planetary climate change, but in the story as living in the paradoxical space of both truth and miracle.

But ghosts and stories are not the only types of puny miracles. The non-human world is also a source of such small wonder-filling events. The novel repeatedly acknowledges the responses of non-human creatures to the ruptures of climate change in the marsh. For example,

[198] "So ist das alles ja nicht gewesen, es ist nie so. Vielleicht war es nicht einmal ähnlich. Ohne die anderen gibt es nur meine Geschichte, ist meine Zunge einsam. Bitte erzählt mir eure Geschichten, erzählt sie, damit meine Geschichte sich nicht mehr allein fühlt: Ich habe die Vermutung, dass eine Geschichte auf ganz ähnliche Weise entsteht wie ein Geist, etwas mit Zufall und Salz, ein bisschen Schweiß, ein bisschen Träne, und dem Schweben zwischen einem Boden und einem Himmel. Und erfindet dazu all das, was wirklich gewesen ist und was ich so schnell vergessen habe: Erfindet mir die mickrigen nebensächlichen Wahrheiten, die uns passiert sind in jedem Jahr. Diese ganzen belanglosen Wunder." (162)

Katt describes how swallows continue their migration patterns despite irregular weather patterns and unusual seasons (i.e., wildfires in November):

> We record the decline of the birds, for days we see none (...) I say, you can't be sure about birds, you can record their disappearance and you'll never know where they've gone, if they're still there, too far up to see them from here, and Maju says, yes, it could be, it really could be. The next morning, the sky is snowy with black and white bodies clustering along a streamline, scattering, forming and dark restless bands drifting across the marshes: It's April, and the swallows are returning as if nothing is wrong, perhaps they didn't get the message (...) The flock of swallows breaks up over the meadows, which are still winter yellow, it hasn't rained once in March, the swallows splash apart like a handful of tossed-up flour (...) under the shelter of the faded awnings of the thousand red balconies, they will glue their nests of saliva and clay, lay their eggs. Arrive and depart, depart and arrive: as long as they move, they still exist. (397-398)[199]

Through the birds' return to the marsh, the text imagines one possible future in which swallows will continue building their nests and following migration patterns. As a reader of cli-fi, this scene cultivates a sense of critical hope for me because it sits with the grief of species loss and the devastating consequences of anthropogenic climate change while at the same time holding on to the possibility of 'petty miracles' without humans. The return of the swallows to the marsh is unexpected and inexplicable according to the 'recorded decline' of their numbers. And yet, our forms of record-keeping are bound to notions of linear time that do not account for the materialities of tomorrow as 'crumbly matter.' Similarly, the marsh plants that keep growing despite harsh

[199] "Wir verzeichnen den Rückgang der Vögel, tagelang sehen wir keinen mehr (…) Ich sage, Bei Vögeln kann man sich nicht sicher sein, man kann ihr Verschwinden verzeichnen und wird nie wissen, wohin sie gegangen sind, ob es sie nicht doch noch gibt, zu weit oben, um sie von hier aus zu sehen, und Maju sagt, Ja, das kann sein, das kann doch wirklich sein. Am nächsten Morgen ist der Himmel verschneit von schwarzweißen Körpern, die sich entlang einer Stromlinie ballen, sich verstreuen, sich formieren und dunkle unruhige Bänder ziehen über den Marschen: Es ist April, und die Schwalben kehren zurück, als wäre nichts, vielleicht haben sie die Nachricht nicht bekommen (…) Der Schwarm der Schwalben bricht auf über den Wiesen, die noch wintergelb sind, es hat im März nicht ein einziges Mal geregnet., die Schwalben spritzen auseinander wie eine Handvoll hochgeworfenes Mehl (…) im Schutz der ausgeblichenen Sonnensegel der tausend roten Balkone werden sie ihre Nester kleben aus Speichel und Lehm, ihre Eier legen. Ankommen und aufbrechen, aufbrechen und ankommen: solange sie sich bewegen, gibt es sie noch." (397-398)

conditions are depicted as part of the small, extraordinary events that we often ignore or only observe as part of a larger project of recording environmental changes.

In short, literary writing and storytelling can help us explore multiple bits and pieces of the inexplicable. The novel outlines multiple human and non-human futures, individual language-image by individual language-image, so that readers are challenged to create some kind of sequential 'chronicle of events.' Moreover, human stories are part of the novel's larger web of other-than-human stories that unfold in the marsh that is itself a layered place-time with its own ways of remembering and erasing, preserving and washing away. From this temporal multiplicity emerges a sense of critical hope in stories and language with which we are left and that remind us of the petty miracles that go unexplained, unacknowledged, and unseen.

CONCLUSION

WRITING ENDINGS WITHOUT AN END

I. On the diversity of cli-fi

Throughout this dissertation, I have discussed the role of cli-fi as a responsive and response-able literary genre that evolves alongside socio-political, cultural, and scientific engagement with the climate crisis. I provided an ecocritical analysis of eight contemporary German cli-fi novels to illustrate the four main questions that I see as most important when it comes to literature's way of grappling with climate change realities: 1) What ideas about genre and modes are needed to understand how cli-fi texts address, shape, and challenge our understanding and imagination of climate change? 2) How does cli-fi narrate non-humans within the larger issues of challenging the ontological divide between human and non-human? 3) How does cli-fi imagine the global processes and vast planetary scales of the Anthropocene that alter our thinking about local places and the emotional bonds we form with these environments? 4) How does cli-fi imagine the complex temporalities of climate change that radically transform our understanding of a now and a future?

In each chapter, I confronted one of these questions by using different novels as examples of the numerous ways literature responds to the narrative challenges that make up and inform cli-fi as a literary genre. I traced these responses within a corpus of multiple texts rather than demonstrating how one single text addresses each challenge for several reasons. First, the variety of climate change imaginaries within my corpus allowed me to showcase the diversity of contemporary cli-fi and to compare and contrast different kinds of literary responses. Second, putting these texts into conversation with each other further nuanced my analysis of the various

methods of storytelling and literary practices within cli-fi. Third, I believe that the ways in which climate change prompts literature to creatively rethink how stories are being told requires a closer look at and *comparative* approach to the broad range of *formal* strategies in a *diverse* corpus. I chose to organize my close readings in terms of questions of genre, human and non-human story, place, and time instead of other sets of questions (i.e., species extinction or technology) because the novels in my corpus address them compellingly and provide a broad range of narrative strategies to engage with these specific issues.

Chapter One laid the foundation for my broader approach to cli-fi as a diverse genre that evolves in a non-linear way and cannot be contained within a set of characteristics. I articulated cli-fi in terms of modes to emphasize the different forms, methods, metatextual practices, manners, and styles in cli-fi that emerge in response to an ongoing crisis. Differentiating between a scientific and a poetic mode allowed me to examine how science shapes the perception and construction of climate change in each of the texts under consideration. *The Swarm* deploys a scientific mode that presents readers with comprehensive scientific knowledge in an entertaining way without providing a metatextual critique of the scientific discourses it depicts. In *Alice*, the scientific mode is used as a means to explain climatological concepts through metaphors and figurative language. *Milk Teeth* provides a radically different approach and lacks scientific perspectives. Instead, this novel seeks to bring readers closer to the affective aspects of the climate crisis by using a poetic mode that reflects on and acknowledges the limitations and power of writing to make meaning in a climate-changed world. Arranging these three novels in this way allowed me to carve out the specificities of the scientific and poetic modes and to show how they nuanced my understanding of cli-fi as a fluid literary genre without clear boundaries.

Chapter Two discussed how cli-fi uses language and story to outline the agency of non-humans in the face of climate change. Using theories of new materialism, my close readings in this chapter focused on the specific formal and narrative strategies that mediate relations to the non-human in *The Swarm*, *The Lamentations of Zeno*, and *Malé*. In *The Swarm*, the yrr disrupts anthropocentric notions of agency. My analysis showed how Schätzing experiments with form to move away from human-centred perspectives and imagine the yrr in less anthropocentric terms. I paired my reading of the yrr with two novels that address questions of non-human agency through their depictions of glaciers and water to further outline the diversity of literary responses that seek to facilitate or create relations to the non-human world. In *Lamentations*, Trojanow depicts the glaciers primarily through the anthropomorphic language used by Zeno while also briefly undermining this perspective by experimenting with a multiplicity of voices that cannot be traced back to a single source. In *Malé*, water becomes an agent of climate change that escapes the constructive work of language. By approaching the issue of representing non-human agencies from a postmodern perspective, Ehrlich problematizes the idea of narrating matter as stories.

Chapter Three focused on the issue of imagining the spatial scales of climate change and the tension this creates with regard to a local sense of place. I paired my analysis of the global and ocean-centred perspective that characterizes *The Swarm* with two novels that reject territorial and fixed notions of place and belonging. In *By The Sward*, Wittig experiments with the trope of the pastoral, interrogates conceptions of place through individual affective perceptions of global risk, and articulates the body as a site of place attachment. In *Winter's Garden*, Fritsch imagines place through the lens of memory and by contrasting the garden with the city. I concluded my analysis by suggesting that the ways in which these novels move away from culturally bound perspectives

point to the need for new vocabularies capable of imagining a world where territorial norms no longer apply.

In Chapter Four, I concentrated on a single novel because Stahlmann's approach highlights particularly well how the genre of cli-fi is constantly evolving, experimenting with language to create 'petty miracles' in a time of despair while simultaneously drawing attention to the limitations of stories to respond to climate change. My close readings showed how Stahlmann narrates the marsh as a space that resists and permeates anthropocentric temporalities and nature-culture dualisms to interrogate our notions of the future and introduce alternative ways of thinking about time. By zooming in on the dynamics of the marsh, Stahlmann contrasts human-centred linear temporal frameworks with a non-human future-present that is always dependent upon the material conditions of place. I ended my analysis with a discussion of the novel's critical sense of hope and the ways in which the poetic mode gives form to 'petty miracles,' which further raises fascinating questions about the futures cli-fi itself might take. Will critical hope in moments of unexpected return (i.e., the birds in *Miracles*) continue to sustain the creation of new language-images (*Sprachbilder*)? Or will readers need alternative modes that do not require slower forms of interpretation and patience for paradox and juxtaposition? For now, it is helpful to come back to Stahlmann's way of attending to such issues. Interestingly, the idea of 'climate-changed' time as slowed down, appears in Leda's goodbye letter, which she leaves for Zeno. In it, she writes about "the end" as a slow process that "you almost forget" and that "even when it starts, can still take time" (210). She continues to describe 'the end' as a slowly unfolding darkness ("The end puts out the lights one by one; one here, one there." (210)). She then suggests that poetry can offer comfort: "But there is always a sequence. The world is so full of sequences, that the ones, that remain, sit on letters and become poems. Sooner or later, you will get tired and confused; a poem is the only

order that counts" (210). To some extent, the novel suggests that the only form fully capable of coping with or coming to terms with a climate-induced ending is poetry.[200]

By providing multiple ecocritical and comparative close readings of novels all written in German – five not yet translated into English – and most of them not yet discussed by scholars (i.e., *Milk Teeth*, *Malé*, *By The Sward*, *Miracles*), my dissertation makes an essential contribution to the study of German cli-fi. By taking an eco-cosmopolitan approach, I placed German cli-fi outside the boundaries of national literatures, which further opens them up to cross-cultural debate. In addition to adopting an ecocritical approach, I organized the novels in my corpus with respect to their most meaningful comparative points. In so doing, I was able to highlight the key issues of the narrative challenges under consideration in each chapter. In contrast to the work of other cli-fi scholars, such as Anderson's categories of "dominant imagination forms in Western climate fiction" (11), Johns-Putra's focus on "posterity-as-parenthood rhetoric" (7), or Trexler's "broad, archival approach to climate fiction" (19), I examined cli-fi from a bottom-up approach that stems from the specific kinds of literary *response-abilities* offered within a corpus of selected novels. Furthermore, while cli-fi scholarship more broadly tends to prioritize American or British authors, my dissertation takes part in recent German Ecocriticism and examines works written by contemporary German-speaking authors outside the Anglophone world. My close readings of their cli-fi novels throughout this dissertation lays the groundwork for understanding a literary shift from responding to climate change as largely a scientific issue to engaging with it poetically and affectively. No less political, these other forms of engagement raise the question of whether literary texts more generally may all be considered 'climate fiction' in the sense of being written in a climate-changed world.

[200] And yet, the novel itself leans so heavily on the poetic mode that it may be an antidote to the despair-inducing visions of an apocalyptic climate end to humanity. This suggests the emergence of other (i.e., lyrical) modes.

Although the texts in my corpus can be arranged in an infinite number of ways, I want to briefly map out other possible constellations that allow me to highlight some of the similarities and differences across my corpus that I was not able to address earlier.

II. Constellations of Cli-fi texts

To explore other possible constellations within my corpus, I would like to return to the key challenges discussed in each chapter. Because the modes I identified in Chapter One do not stay within clear boundaries, a comparison of the different approaches to the scientific mode in other texts, such as *Lamentations* and *Winter's Garden*, further illustrates how the poetic can infuse the scientific. Whereas the character of Zeno, a scientist who gives lectures and tries to communicate the urgency of melting glaciers, provides a scientific perspective, Trojanow's focus on Zeno's strong emotional bond with them and the novel's shift to a "fragmented poetics" (Dürbeck, "Ambivalent characters" 116-19) points towards a blend of the scientific and the poetic. The naming of specific plant species in *Winter's Garden* suggests a different scientific lens compared to *The Swarm* or *Alice*. Instead of presenting science as the dominant way of knowing the world, the botanical lens in *Winter's Garden* is part of the text's broader environmental imagination that is also shaped by Anton's subjective knowledge and memory. Because *Miracles* emphasizes the resilience of plant species and its focus on the marsh provides a less anthropocentric perspective, placing this novel alongside the texts in Chapter Two would have been another valuable constellation to further analyze the role of the non-human within the poetic mode.

Looking at how some of the novels in my corpus articulate climate change in generational terms and address the theme of parenthood and the role of children as part of their imaginations of the future provides an additional direction to approach questions of temporality. For example, in

Milk Teeth, the sudden arrival of a child prompts Skalde to write a report about her life and swim across the river that cuts the community off from the rest of the world. In *Winter's Garden*, the idyll of intergenerational living in a garden is narrated through the lens of childhood memory and nostalgia. Interestingly, the novel includes descriptions of a birthing clinic and a newborn child as part of the group who seeks refuge in the garden, which evokes the significance of the child as a symbol of hope in apocalyptic worlds.

Approaching my analysis from an ecocosmopolitan perspective, I situated the texts in my corpus within the context of the global and the planetary and read them "environmentally" (James 66), which means that I focused on the ways in which their language and form construct and interact with physical environments, but also how this imagination is shaped and affected by the material reality of these environments. Asking how each text incorporates, draws on, complicates, or even erases culturally specific elements is another way of rearranging my corpus. As I pointed out in my introduction, my collection of cli-fi novels sits within the tension between the cultural and the global. On the one hand, it includes novels that, despite being *written in German*, move away from culturally bound perspectives and appeal to a global readership, such as *The Swarm* or *Alice*. For example, Boysen's use of metaphor and climate modelling does not bear any traces of a specifically German environmental imagination. On the other hand, other texts, such as *Winter's Garden* or *Milk Teeth*, can be read as *German* through a more culturally specific analytical lens and could be approached from the importance of history, memory, decay, and decline in a German environmental imaginary tradition. Although I noticed a tendency within my corpus towards less cultural perspectives, this does not mean that all German cli-fi texts are now no longer German in the cultural sense, but rather that they require different approaches in terms of addressing the question of culture. Thus, rather than identifying a set of characteristics to give one single

definition of *German* cli-fi, the question of culture requires a multi-pronged approach. One of these approaches is to situate cli-fi novels with respect to German literary traditions and from a historical perspective.[201]

III. Writing Endings Without an End: Possible future directions

In the process of researching and assembling my corpus, I found a great number of contemporary German novels that offered interesting responses to climate change. However, due to the scope of this project and my four main questions, I ended up not including some of them. My choice of texts allowed me to identify scientific and poetic modes, and my close readings show a tendency towards less scientific and more poetic modes. Coming back to the novels I had to set aside and analyzing them in terms of mode would be a possible direction for further research. Since I argue that cli-fi is a literary genre that constantly evolves, inquiring about new kinds of modes of cli-fi is an important next step. For example, Heinz Helle's novel *Euphoria/Eigentlich Müssten Wir Tanzen* (2015)[202] or Raphael Thelen's novel *Wut/Anger* (2023)[203] suggest the emergence of affective modes.

The future potential research questions I find most interesting and exciting emerge from my reading of *Miracles* in Chapter Four: How does cli-fi respond to the 'unresolvability' of the climate crisis? What kinds of narrative endings do cli-fi texts offer to end stories about something that has no end? And, finally, what do the endings of cli-fi novels reveal about how cli-fi situates

[201] As suggested in "German Studies in the Era of Climate Change: The Value of Historical Perspectives" (Schönberg & Holmes) this direction requires a comparative approach, which would have gone beyond the scope of this project but is one way this dissertation can spark future research projects.
[202] Helle's novel focuses on survival and violence (i.e., rape) in a post-apocalyptic environment: A group of young men finds themselves in a strange post-apocalyptic landscape after spending a weekend in a mountain cabin. As they wander through forests and face the challenges of surviving in a devastated mountain village, the theme of climate change is present within the imagery of violence, hostile environments and the struggle for survival.
[203] At the centre of Thelen's novel are three young climate activists and their anger towards the political establishment in the face of urgent crisis. Moreover, Thelen himself is a climate activist, which lends his novel to a comparison with Boysen's text and opens further questions regarding political modes.

its abilities to respond with respect to the broader issue of responsibility within climate change discourse?

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