Art and Science Worlds in Times of Ecological Urgency

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Collaborations between art and science raise fundamental questions about how and where disciplinary boundaries are being drawn. With this special issue on *Art and Science Worlds in Times of Ecological Urgency* we seek not only to shed light into the generativity of co-creations between artists and scientists but, more fundamentally, we aim to trouble the very congealment of the boundaries that have historically coalesced to delineate what we call "art" and what we call "science." Thus, this special issue invites us to consider that disciplinary boundaries must not be taken as self-evident and that their making must be recognized and investigated (Barad, 2007).[1] More importantly, we emphasize that this process thus involves a non-innocent approach to our knowledge production practices (Haraway, 2018 [1997]).

However, this is not simply about the destruction of boundaries or, even less so, a mere fusion between art and science. As Donna Haraway rightly points out, fusion is always "a bad positioning strategy" (Haraway, 1995: 25). Rather, we are interested in the situated and embodied producing of these boundaries and the ways in which they are solidified, but also expanded, retracted, and twisted. After all, as Haraway teaches us throughout her work, "(...) one must be in the action, be finite and dirty, not transcendent and clean." (Haraway, 2018 [1997]: 36), because "the point is to make a difference in the world, to cast our lot for some ways of life and not others" (Haraway, 2018 [1997]: 36). Therefore, when we talk about the worlds of art and science, we refer to the pleasure and power of blurring, disrupting, destabilizing, and re-articulating disciplinary boundaries,

[1] For an extended discussion on collaborations in art and the contentious materializing of boundaries, disciplinary and otherwise, see: Spitzner (2023).

understanding that this movement is crucial not only for questioning authorized forms of knowledge production, and their consequences in the world we live in, but also for raising ethical, epistemological, and political issues and concerns.

Therefore, this special issue, with the title and its added recognition of our catastrophic times, aims to situate the works presented in this volume in the *here* and *now* of which we are part and for which we must be, differently, but viscerally responsible. Precisely for this reason, we chose "Ecological Urgency" as the title, intending to avoid apocalyptic narratives that can be sparked by the term "emergency." Following Haraway's words once again, we believe that "these are the times we must think; these are the times of urgencies that need stories" (Haraway, 2016: 37). It is this temporality of urgency that we choose to inhabit and it is from the need for other stories in times of ecological urgency that this special issues springs from.

The many collapses that compose the current ecological crisis have also produced major shifts in our institutional ways of producing knowledge. As Rosi Braidotti and Hiltraud Casper-Hehne (2023) point out, all these transformations we are experiencing end up bringing "together disciplinary categories which were until now kept apart – for instance the earth sciences, literature, philosophy and history, producing a mix of human-centered and post-anthropocentric knowledge practices, which grants the same cognitive attention to non-human as to human entities and actors" (Braidotti & Casper-Hehne, 2023: 464). These approximations between categories and fields, as well as the "qualitative changes in methods" that accompany them, have also contributed to thinking about the issues of a "collaborative ethics (...) and [a] relational openness" (Braidotti, 2019: 79).

It is precisely by attending to the need to develop alternative stories, and the recognition of the importance of interdisciplinarity in addressing the multiple and multifaceted problems posed by the ecological crisis, that we have brought together the seven essays that give body to this special issue. As will be seen in what follows, the essays are written by researchers at varied levels of education (undergraduate, master's, doctoral), situated in diverse fields of knowledge (art, anthropology, philosophy, design, biology, geography, ecology, and geoinformatics, to name just a few) and from different regions of Brazil (Minas Gerais, Rio Grande do Norte, São Paulo) and also different European countries (Netherlands, Belgium, Austria). Through very distinct paths, methods, and collaborative relations, the visual essays presented here engage creative processes that mobilize photography, sculpture, performance, collage, drawing, and embroidery, raising crucial questions about multispecies relationships, the colonial logics and dynamics that constitute the ecological crisis, the ethical problems and responsibilities involved in research partnerships, the situatedness of collaboration, among many other contentions as well as urgent issues.

Thus, as in any editorial process, in accepting these essays we cast our lots for some worlds and not others. With our choices, always made from the recognition of a relational ontology (Barad 2007; Haraway, 2016), we hope to highlight, above all, the generativity of situated worlds, of collaborative worlds, of worlds of shared commitment

and responsibility, worlds that can only be inhabited through *being-with*, *becoming-with*, and *thinking-with*.

Being-with, becoming-with, and *thinking-with* are ways of being in the world while also constituting methodologies that can be called collaborative. In light of this, it is important here to mention that the concept of collaboration is central to our special issue while also having become undoubtedly also central to the production of knowledge in various areas of the Sciences and Humanities (Siemens, 2015), becoming thus a fundamental theoretical-methodological dimension of research in recent decades. Despite having different genealogies in distinct disciplines, in general terms, collaboration indicates a mode of work that is explicitly and deliberately *shared* (Lassiter, 2005).[2] hen taken seriously in the production of knowledge, the notion of collaboration ends up raising important questions about the power relations that permeate all research, in addition to challenging epistemological basis, which are often taken for granted, in this way destabilizing assumptions about ethics, authorship, neutrality, as well as responsibility.

In light of this, we are interested particularly in how human and more-than-human collaborations can produce other possible worlds. In this sense, we understand collaboration as an open practice of engagement that, in the face of the various collapses that make up the ecological crisis, highlights the very possibility of *"collaborative survival"* (Haraway, 2016: 37). After all, as anthropologist Anna Tsing states, we need to survive collaboratively "(...) in disturbance and contamination. We need this skill for living in ruins" (Tsing *apud* Haraway, 2016: 37). For this very reason, we sought to select essays that brought to light different facets of collaboration. We prioritized both experiments with collaborations between disciplines and between research fields, as well as those that had as the focus of investigation the research collaborators, whether human or non-human. Thus, plants, lichens, computers, algorithms, fungi, bacteria, and glaciers also appear as important companions within the research and the various creative endeavors gathered here.[3]

The essay that opens this special issue, *Mending Cracks*, stems precisely from a notion of collaboration that can be classified as more-than-human. Through creative work involving artists, scientists, bacteria, and fungi, Nele Buyst, Christina Stadlbauer, and Varsha Paleri seek to address cracks in both ceramic pieces and modern disciplines. By replacing the gold traditionally used in *Kintsugi* – a Japanese technique used to repair broken pieces of ceramic – with bacteria and fungi, the authors enter the field of synthetic

[2] It is worth noting that the concept of collaboration has been particularly important to the arts for several decades now. The art historian Claire Bishop, for example, points out that "alongside 'utopia' and 'revolution', collectivity and collaboration have been some of the most persistent themes in artistic production and exhibitions over the last few decades" (Bishop, 2012: 12).

[3] In contemporary art, terms such as more-than-human art (Tsing et al., 2017), interspecies art (Ullrich, 2019; Adams, 2020), or even trans-specific art (Rodado, 2022) have been used to describe these extended collaborations involving artists, scientists, and a myriad of more-than-human beings. In general, these terms seek to describe works that explore speculative dimensions of multispecies worlds on a endangered planet (Van Dooren et al., 2016).

biology and, at the same time, raise important reflections on artistic creation, ethics, and multispecies care. In the photographs that compose the essay, we see a striking contrast between materials and temporalities. On one hand, we have the durability and hardness of gold, as well as of disciplinary boundaries, with their principles and institutions; on the other hand, there is the vivacity of bacteria and fungi, but also their fragility, impermanence, and the care required for their growth. Microorganisms require time to develop, they continue to transform within the repaired parts, and eventually die. Thus, in contrast to the gold traditionally used in repairs, fungi and bacteria take much longer to mend the broken pieces, and once the repair is done, they ensure a much shorter lifespan and, overall, a much more fragile reparation.

This makes clear that these "living lines of repair" (Buyst, Stadlbauer, and Paleri, 2025: 2), as the authors call them, challenge the recurring logic of restoration and the impulse to conserve artistic objects. For example, the humidity and temperature necessary for fungi and bacteria to grow and reproduce, within the repair project developed by the authors, is precisely what needs to be controlled within museums and art collections to ensure the conservation of the objects they hold. Therefore, this essay invites us to consider how modern separations and purifications tend to be insufficient and problematic when what is at stake are the material conditions that ensure human relationships with other forms of life. Fungi, with their voracious appetites, as Anna Tsing reminds us, "are always ambivalent in their benevolence" (Tsing, 2015: 184), and taking them as companions implies taking these ambivalences seriously. The decomposition of matter and the recycling of nutrients in a myriad of ecological cycles are their great gifts, but also the great terror for the conservation of countless materials, such as papers, canvases, frames, and books that fill the collections of libraries and museums. Rejecting anthropocentric views, the essay highlights the challenges of multispecies coexistence itself and, thus, is precise in bringing to light the complexities related to ethics and care that are inevitably implied in the very idea of collaboration with non-humans, including with regard to the thin line that separates collaboration from exploitation.

On the other hand, the essay *Dreaming Matter: Pina and AI as an Oracle of Forms and Absences*, written by the Brazilian artist and researcher Rodrigo Ferrarezi, presents Artificial Intelligence (AI) as a working partner, based on a creative process of "structural co-authorship between 'machine thinking' and human manual skills" (Ferrarezi, 2025: 1). The artist compiled a set of approximately 600 image records of sculptures from the Pinacoteca de São Paulo collection and then used AI to perform a series of interpolation and image fusion operations that resulted in combinations that detected presences and absences in the institution's collection. As the first images of the essay make clear, the image collections produced by the AI become distorted and amorphous with each output, so that we can observe something that resembles the melting and mixing of the sculptures in the collection. In a second stage of the process, the AI outputs established the reference point for the artist to create a series of 20 ceramic objects called *Πίνα (Pina)*. Without becoming replicas, these unique handmade pieces created by the artist accentuate the processes of inspiration, translation, and co-creation involved in the project. In the author's words, the partnership with AI enables the creation of "a new formal lexicon

detached from the original sculptural images but still echoing their underlying characteristics." (Ferrarezi, 2025: 2).

Artificial Intelligence, mobilized as a companion by the artist, is undoubtedly one of the major themes of our *here* and *now*. Not surprisingly, it is at the center of debates and reflections unfolding in different areas of knowledge production. These debates show that AI raises new questions about how our ways of life are inevitably linked to digital and informational infrastructures, posing problems regarding autonomy, algorithmic management (Danaher, 2016) and governance (Redden, 2018), and also complicating the processes of "datatification of life," that is, the processes of converting the most diverse instances of action into data (Lemos, 2021; Nieborg and Poell, 2018). In these debates, the focus on the materiality of AI has also become increasingly frequent, especially to show how AI – and all the technoscientific apparatus that sustains it – are intrinsically linked to current environmental problems. In other words, AI depends on a "climate extraction" (Brodie, 2020) that involves both the extraction of minerals – which often articulate the unequal dynamics between the Global North and the Global South – and toxic chemical processes, such as excessive use of water resources, disposal and emission of waste, and the carbon footprint they produce.

Through a unique creative process, Ferrarezi's essay, in a certain way, engages with these discussions, challenging various contemporary imaginaries and discourses about AI.[4] An example of this is that the artist's process underscores the creative power of this technology without attributing autonomy to it, something common in discourses about the recent developments of the Large Language Models (LLMs), as noted in the aforementioned studies. Contrasting with this logic, in his essay, AI is primarily revelatory and not autonomous. It operates like an "oracle of forms and absences," performing a synthesis of a sculptural artistic canon present in the Pinacoteca de São Paulo collection that also illuminates the specter of exclusions contained within this canon. By exploring this creative power of AI, the essay thus highlights the importance of politicizing the idea of algorithms. As demonstrated by the artist in relation to the Pinacoteca de São Paulo collection, with which he works, the traces of technology are not neutral. They are products of various choices that form a dataset that is only then analyzed and manipulated by AI. Bu the question then is also how this process, at the same time, involves a dimension that escapes pre-established patterns, especially through "form transfiguration" (Ferrarezi, 2025: 3). In this way, by highlighting the creative and artistic potential contained in these moments when the AI "dreams", the artist points to other imaginaries and possible relationships with technology.

In line with collaborations involving bacteria, fungi, and algorithms, the essay *Glaciers - Transcending Disciplinary Boundaries in Artistic Research*, produced by Collective et art., presents us with a form of collaboration involving scientists, artists, and a glacial landscape. In the face of climate change, the primary objective of the essay, written by

[4] This is also an effort stemming from the debates mentioned above, which seek to critically examine the idea of autonomy associated with AI, acknowledging that data is not neutral, but rather the result of collection, refinement, and analysis processes based on statistical pattern analysis.

Konstantina Maria Hornek, Johanna Unterpertinger, Cornelia Dirnberger, Christian Prohammer, and Frida Teller, is to develop a hi(s)tory of a glacier located in the Austrian Alps – the Schlatenkees Glacier. What is being called a hi(s)tory is a type of narrative that carries not only the history of the glacier but also its materiality and its melting due to the accelerating climate crisis. As the collective aptly indicates, the glacier is not merely a physical entity; it is also "a repository of more-than-human storytelling and a symbol of collective futures, shared fear and pain" (Hornek et al., 2025: 2). The 89.5 meter retreat of Schlatenkees in a one-year period, as indicated by measurements taken between 2021 and 2022, gives an idea of the speed of ecological transformations and also indicates the many challenges in the relationship between global urgency and local consequences.

The collective's starting point is scientific research on glacier retreat conducted by specialists in geography, ecology, and geoinformatics. Understanding that glacier research involves more than just data and laboratory analyses, the collective's team embarked on field research and encountered the water and air flows of Schlatenkees, as well as the echoing and cracking sounds of breaking ice and the long silences that mark glacial landscapes. From this, the team produced texts, collages, and audio pieces that seek to portray these diverse material landscapes of Schlatenkees. It is precisely some of these materials that compose the essay presented in this special issue. For the authors, the mixture of scientific and artistic methodologies helps to bridge the gaps between scientific data and emotions related to climate change, making it possible to produce what they call a "shared sense of responsibility and care" (Hornek et al., 2025: 3).

In this way, the visual and sound essay produced by Collective et art. highlights how the melting of glaciers challenges the idea of permanence so frequently employed in discussions about environmental conservation, demanding a closer look at the threatened and deteriorating landscapes that surround us. Precisely for this reason, the retreat of glaciers, as the authors suggest, represents a "symbol of collective vulnerability" (Hornek et al., 2025: 4). Although collective, as we will discuss later in this text, it must never be forgotten that vulnerability related to the climate crisis is experienced in very distinct and unequal ways in different landscapes and parts of the world. Geopolitical issues associated with the unequal dynamics between the Global North and the Global South, both in terms of the causes of the environmental catastrophe and the consequences they cause, are essential to consider in this regard.

In *Roaring Beyond the Windowpanes*, the threatened landscape is also central. In this essay, we learn about the work of the Mbuchi collective, a family collective formed by David Habets, Eva Posas, and Biguzaa Habets-Posas, based between the Netherlands and Mexico. Together, they have worked at the intersection of ecological psychology, visual arts, and philosophy, focusing on the interconnection between what they call "mental panoramas" and "ecologies of living beings" (Habets, Posas, and Habets-Posas, 2025). The essay emerges from encounters and walks undertaken by the family group during an artistic residency amidst the landscapes of the West Cork coast in Ireland; the same landscape where, more than 200 years ago, a pioneering botanist in the study of lichens, liverworts, and seaweed, named Ellen Hutchins (1785-1815), lived and worked while undergoing treatment for a serious illness that ultimately led to her premature death.

Interested in Hutchins' "mental landscape," as well as the archival, ecological, and personal layers linked to her biography and her botanical work on the West Cork coast, the collective explores the "poetic and pragmatic connection" between Hutchins' search for fresh air and her attention to lichens, liverworts, and seaweed, which, as the authors point out, are the most ecologically sensitive organisms to climate change (Habets, Posas, and Habets-Posas, 2025). With these interests, the collective employs a range of scientific and artistic tools: archival research, conversations with local experts, phenomenological interviews, taking large-format photographs, and printing negatives as cyanotypes on glass plates.

Most of the images presented in the essay seek to convey the embodied relational experience of botany with the mountain landscape through which Hutchins walked and collected specimens. This is achieved primarily through the use of large-format photography, a medium known for the unpredictability of its results and for highlighting the manipulations performed during the photographic process, as well as the environmental influences that occur while taking the photograph. What we see in most of the images created by the Mbuchi collective is revealed to us through the negatives of the large-format photographs printed as cyanotypes on glass plates. Therefore, blue abounds in its different shades. What we see are windows and mountains treated as laboratories; windows and mountains enveloped in distinct but completely intertwined human and more-than-human temporalities and relationalities, or, as the authors themselves suggest, windows and mountains that place us before "shared presences" (Habets, Posas and Habets-Posas, 2025: 4).

Among fungi, bacteria, algorithms, and landscapes, we perceive the multiplicity of "shared presences," to borrow the term from the Mbuchi collective; we can in this way note multiple collaborative forms of knowledge production and an evident post-anthropocentric effort. Most certainly, as Rosi Braidotti warns, truly treating non-humans as collaborators in knowledge production requires "conceptual and methodological transformations" (Braidotti, 2019: 75). Thus, engaged with precisely this need, these four essays show the central place of interdisciplinarity in this effort, as well as its generativity, underlining the interdependence of humans with other beings as an unavoidable ontological condition. In other words, they point to *multispecies entanglements* or, in the words of Thom van Dooren, Eben Kirskey and Ursula Münster, they gesture towards these "'ecologies of beings', dynamic environments that are continuously being shaped and reshaped; actively – even if not always consciously – worked through the sharing of 'meanings, interests and affects', as well as flesh, minerals, fluids, genetic materials and much more" (2016: 42).

Notwithstanding, this body of work shows that the effort of collaboration with non-humans involves a range of complications. After all, the boundaries between collaboration, use, and exploitation are by no means a given; just as no ethics are prescribed to be activated beforehand, no ethics then precedes the encounters and the collaborative relationships themselves. In this sense, the essays make explicit precisely that collaboration, ethics, and companionship need to be produced in a situated and embodied way and that, when considered through more-than-human encounters, require particular

creative, attentive, and responsible forms of engagement.

Expanding and complexifying the scope of what can be understood as more-than-human collaboration, these four essays so far introduced, as well as the three that will follow, handle the worlds of art and science – giving them life, flesh, and materiality – in unusual and creative ways, opening possibilities for thinking about careful forms of relationality in knowledge production (Boldrin, 2024), while also pointing to the potential of care to "reaffect an objectified world" (Puig de la Bellacasa 2017: 65). Against the combination of urgency and indifference that characterizes the global catastrophe, as highlighted by Denise Ferreira da Silva in her conference during the 2025 ANPOCS Meeting, the essays presented here, and the collaborations that give them support, underline careful ways of being-together in the production of knowledge, evoking different temporalities, relationalities, and affectivities that are still possible in our catastrophic times.

It is worth here noting how these catastrophic times were very quickly explained using the term Anthropocene, thus naming a new geological era as being characterized by the impact of human actions on a planetary scale. The concept of the Anthropocene became the main descriptor and articulator of problems related not only to climate change, but also to the various other facets that make up the ecological crisis.[5] Despite the unavoidable relevance that this concept has acquired in the environmental debate, a broad and necessary critique has been made of the "anthropos" in the term and the homogenizing narrative that derives from it (Tsing, 2021; Haraway, 2016; Taddei, 2016; Taddei, Shiratori and Bulamah, 2022; Danowski and Viveiros de Castro, 2015). This critique can be particularly understood through a proliferation of terms – Capitalocene, Plantationocene, and Negrocene – which demarcate the generalist and universalist sense of "human" and "nature" implied in the concept of the Anthropocene and, more than that, highlight the ways in which these conceptions are intertwined with a series of erasures.

Thus, the Capitalocene (Moore, 2006) aims to shift the focus from the "human" to the capitalist system; the Plantationocene adds layers to the exploitative dynamics of Capital, highlighting the central role of large-scale monoculture in the ecological crisis (Haraway et al., 2016); and the Negrocene (Ferdinand, 2022) emphasizes how the production of disaster is inseparable from race and colonialism and, more specifically, from a "colonial dwelling on the land," that is, from the way in which the transatlantic crossing implied a "singular conception of the existence of certain humans on Earth – the colonizers –, of their relations with other humans – the non-colonizers –, as well as their ways of relating to nature and to non-humans" (Ferdinand, 2022: 48-49).

As Marras and Taddei summarize, the problem with the term "Anthropocene" is that it "naturalizes and renders invisible countless issues, and these erasures are, in themselves, fundamental elements of analysis" (Marras and Taddei, 2022: 15). Therefore, what is at stake in this critique, briefly and partially recovered here, is the fact that, far from being the result of the destruction of the planet by "humans," what we are

[5] The concept of the Anthropocene was popularized by the American biologist Eugene Stoermer and the Dutch Nobel laureate in Chemistry Paul Crutzen in the 2000s (Crutzen and Stoermer, 2000).

experiencing is the result of particular historical conjunctures, namely capitalist colonial racial exploitation (Yusoff, 2018; Haraway 2017; Ferdinand, 2022; Povinelli, 2024; Sá Barreto, 2022). In view of this, it is fundamental to bear in mind that, as Ghassan Hage (2017) points out, it is not only a matter of racialized populations, which were historically relegated to precarious conditions of existence, suffering and continuing to suffer disproportionately from the effects of climate change but, more than that, it is about how the very operational logic of racial colonial capitalism is intrinsic to the production of the current environmental collapse. Therefore, it is essential to recognize how the ecological crisis is intrinsic to this matrix of power that intertwines capitalism, racial colonialism and the very project of modernity.

In this special issue, this intertwining is particularly and eloquently articulated by Karen Custódio, Victória Queiroz, and Tiago Sales in the essay entitled *Questioning Environmental Racism Among Ruins and More-Than-Human Landscapes in Goiabal Park.* Created as part of a course in the Biology Licentiate program, the essay presents a performance, shown through photographic records and an accompanying poetic text. In the first photograph, we are confronted with the Black body of the first author and performer stretched out amidst the ruins of *Goiabal* Park, a public park located in the city of *Ituiutaba* (located in the state of *Minas Gerais*), explicitly showing a continuity between the exhaustion of the performer and the ruin of the *Cerrado* landscape. In the second photograph, the performer, who is amidst the greenery of the park, wears a white lab coat, and her face and arms are smeared with white paint.

The white lab coat, as a material-semiotic object, far from being a mere piece of clothing, as anthropologist Rosana Castro (2022) has already argued, condenses instead the complex racial grammars that constitute the racist arrangements of the knowledge-power nexus present in the historical development and current practice of scientific knowledge production. Thus, from the outset, the essay brings to light the intrinsic relationships between racial colonial capitalism and the environmental crisis, while simultaneously producing a persuasive questioning of the colonial logics that permeate authorized modes of knowing and of knowledge. This critique gains even more traction in the essay's third photograph, which shows a close-up of the performer's contorted face, who is shown also forcefully smearing her neck with white paint. The caption accompanying the photograph reads: "Throat: painting doesn't change the 'truths' that need to be told" (Custódio, Queiroz and Sales, 2025: 7). Thus, amidst the ruins of the landscape, it is remarkable how, through the combination of performance, visual register, and poetic text, the essay addresses the racialized violences that are embedded in authorized forms of scientific production, thus powerfully challenging the racial/colonial grammars of modern knowledge production and its regimes of truth.[6]

The performance, then, posits the bodily as itself a form of knowledge production, recognizing that knowledge is contained within the body, as argued by Leda Maria Martins (2021). With this, the project, carried out by undergraduate biology

[6] In this regard, see Denise Ferreira da Silva (2022a) on the production of the "Transparent I" in modern (scientific) thought.

students in partnership with the course professor, also destabilizes the very authority of writing as a hegemonic form of valid knowledge. That is, the performance presents not only a provocation, but is itself constitutive of an argument that underscores the potential of the body as a producer of knowledge through a necessary critique of the epistemological foundations of knowledge production—white, racist, and colonial foundations—that establish some bodies as subjects and producers of knowledge and others as objects of scientific study.

The fourth and fifth photographs of the essay, which focus on the performer's face expressing a vague gaze and a restless emotion, are accompanied by a caption that declares: "Looking at something bigger, erasing excessively human, white, colonial impositions" (Custódio, Queiroz and Sales, 2025: 8).[7] Finally, in the last two photographs that compose the essay, the ruins of the naturecultures of the *Cerrado* biome that still exist in *Goiabal* Park are captured, but what is shown is also a hopeful glimmer and a non-innocent vision of other possibilities for flourishing amidst ruins. Possibilities emphasized mainly through the last image of the essay, where a gap is seen through which trees are still visible and remain monumental.

As Karen Barad (2010) argues, what matters in these turbulent times is to trace the marks left on bodies and therefore to become responsible for the violence that produces these marks, which necessarily includes tracing the mattering of the boundaries between subject and object, as well as the boundaries between disciplines and their forms of producing knowledge. In this essay, the marked Black body is brought to the forefront at the intersection of art, science, ecological crisis, and racism, echoing what Denise Ferreira da Silva (2022b) argues, namely: that it is not a finished colonial past that produced the climate crisis as its effect, but rather that colonialism continues to operate beyond the limits of space-time. Highlighting how racism/colonialism is constitutive of capitalism as a mode of production and of modernity as a civilizational project (Mbembe, 2017), the essay by Karen Custódio, Victória Queiroz, and Tiago Sales, also demonstrates the inseparability of social justice from environmental issues (Ferdinand, 2022).

It is therefore a matter of understanding that colonialism is not reducible to a "monolithic structure" (Liboiron, 2021: 6) and that it is not confined to a closed historical past (Sharpe, 2016). For this very reason, we understand that producing and telling stories that recognize and make visible these links is fundamental to creating conditions and possibilities for responding implicitly and responsibly to the ecological crisis, which means rejecting the arrow of linear time and the constitutive erasures of the power matrices that produced this crisis. Thus, it is a matter here of perceiving and acknowledging how the colonial capitalist machinery that subjects the planet to exhaustion is the same machinery that produces the systematic precarization and depletion of human and more-than-human lives.

Focusing on the toxic dimensions of the ecological crisis, the essay *Chemical Histories: Making the Invisible Visible* also touches on these issues. Authored by Dario

[7] In this sense, we need only to look at the history of the development of anthropology as a discipline, which has produced marked and racialized bodies as objects of knowledge (M'charek 2020).

Perfigli, the essay examines an ordinary object: the Billie cup, a reusable cup introduced in Dutch educational institutions to reduce waste. Through an experimental creative process that articulates media studies and speculative design, the work highlights how this common and everyday object carries a chemical history obliterated along the production chains of Capitalism. In other words, the essay makes visible that this cup, marketed as a sustainable alternative – just like AI – is materially linked to extraction processes through the production chain of polypropylene, a chemical derived from petroleum. Beyond making this link visible, and disrupting the discourse of sustainability associated with the cup in the Dutch context, the essay expands its creative objective and presents an alternative prototype of this common object, as a result of the author's collaboration with the designer and philosopher Kaush Kalidindi.

Engaging creatively with speculative design techniques to produce distinct imaginaries, challenge dominant sustainability narratives, and generate new relationships, Perfigli proposes a "performative staging" (Perfigli, 2025: 4) that articulates the prototype of the cup and coffee, an element mobilized to simulate an oil spill and its catastrophic and uncontrollable effects. Thus, the oil spill represented by the coffee dripping from the prototype's porous boundaries functions as an image that underscores the ways in which chemical agency transcends frontiers, extending to places that are not visible in the product itself (such as, for example, in the case of the Billie cup). It can be said that the focus of the performative staging presented in the essay is the circulation of chemicals and the ways in which it traverses time and space, something that has been shown by several authors who are dedicated to the investigation of toxicities (Mbembe, 2021; Fortun, 2012; Boldrin, 2025; Shapiro and Kirksey, 2017; Liboiron, Tironi and Calvillo, 2018).

Although this issue goes beyond the scope of the essay, it is worth pointing out that coffee production chains, like those of reusable cups, also involve mechanisms of invisibility. Coffee, a product historically linked to colonial capitalist entanglements, acquires other layers of meaning when symbolically associated with oil in the essay, complicating the ties and relationships of production chains. Thus, the interdisciplinary and collaborative experiment proposed by Perfigli shows the intertwining of chemical products and extraction networks, undoing the spell of commodity fetishism (Marx, 2013) and making visible that the chemical history of the body is inherently connected to the entanglements of colonial capitalism.

The visibility of this link raises a series of questions about the petrochemical extraction processes that underpin the materiality of everyday products, as well as inevitable questions about the overlaps between toxic living conditions and unequal geographies of power (Ahmann and Kenner, 2020; Boldrin, 2024). In this sense, Dorceta Taylor shows that the "hazardous installations" – factories, landfills, petrochemical plants, hydroelectric plants, and chemical storage facilities – that constitute the colonial capitalist machinery are primarily concentrated in poor and racialized communities, systematically exposed to all sorts of risks. We perceive, therefore, that the multiple effects and consequences generated by these hazardous installations and extraction processes are not experienced in the same way. There is a profoundly unequal distribution of harm and risk (Mbembe, 2021).

To a large extent, chemical stories like the one told by Dario Perfigli in his essay show how the displacement of wealth and comfort occurs in the opposite direction to the displacement of harm and toxicities (Povinelli, 2024; Murphy, 2000), which touches on both the unequal dynamics between the Global North and the Global South and the dimensions of regional inequalities. With this in mind, making the displacement of harm and toxicities visible, perceiving their multiple effects on human and non-human lives, is fundamental for us to understand how these unequal geographies are also constitutive of a "colonial inhabitation of the Earth" (Ferdinand, 2022). Thus, undoing the spell of commodity fetishism, *Chemical Stories* – an essay conceived in the Global North, it is important to note – allows us to ask urgent questions, such as: where are the petrochemical extraction enterprises located that produce the raw material for the manufacture of the Billie cup and other everyday products? What are the localized effects of this chemical agency, and in what ways are they rooted in colonial logics?

These two essays, which deal in different ways with the erasures that constitute the debates about the urgencies of our times, show precisely the importance and need to produce new histories – other narratives – as we are trying to emphasize in this special issue. In dialogue with Barad (2017) once again, we believe it is necessary to trace entanglements that bring to light these violent histories of capitalist colonial racism. We need stories that open up possibilities for an embodied remembrance of these entanglements and that, fighting against practices of erasure, perform "(...) a work of morning more accountable to, and [that does] justice to, the victims of ecological destruction and racist, colonialist, and nationalist violence, human and otherwise—those victims who are no longer there and those yet to come" (Barad, 2017: 56).

Unlike the other essays in this special issue, Gabriela Novaes Santos' work presents a single visual piece: a photograph of the embroidery *"Fabulous Scene."* Despite being unique, the piece emerges simultaneously as both the process and the result of an anthropological research project focused on storytelling in *Mituaçu*, a *quilombola*[8] community located in the city of *Conde* (located in the state of *Paraíba*). It is a fabulous piece because it elaborates a *fabulative* (re)creation of the community and its relationships, particularly based on a story told by the elderly women of the community, that intertwines humans, mango trees, and fungi. Raising questions about the circulation of memories, multispecies relationships, knowledge, and troubles that traverse the past and present of the territory, the creative process of fabulation materialized in the embroidery draws attention, among other things, to how it condenses and articulates different facets and layers of collaboration.

In *Embroidering Trouble: Creating Stories with the Mango Trees of the Mituaçu* Quilombo *Community*, collaboration appears as a notion that involves relationships with the elderly women of the community, with the artisans in the author's own family who taught her the practice of embroidery, and with the members of the research project *Stories of the Quilombo*, of which the research that gave rise to the essay is a part. From the

[8] *Quilombos* are settlements of Afro-descendant peoples whose communities were established by runaway enslaved peoples in Brazil.

residents of *Mituaçu*, through the different researchers of the research project, to the artisans in the author's family, the different collaborations woven into the embroidery make explicit a conception of shared work that offers an enormous contribution to this special issue. After all, the collaborations that are at stake in the essay are not innocent. They are not romanticized, purified, or free of complications. In other words, the collaborations presented by Gabriela Novaes Santos imply and are implicated in troubles that constitute and permeate the knots and weaves in that are present in the material of the embroidery fabric itself.

The knots and weaves carry troubles, insofar as embroidery also becomes a manual apparatus for reflecting on the links "between the *quilombola* community and the university, between plants, fungi and stories, between *non-quilombola* women and *quilombola* women, between crafts and anthropological work" (Novaes Santos, 2025: 3). It is precisely for this reason that this artisanal path is understood by the author as a "tactile-reflective practice," an affectively engaged practice that performs and gives rise to other practices. Showing the centrality of touch in creation and connecting scientific practices and manual practices, those by and with women, which are created through collaborative arrangements based on affective and responsible engagements, embroidery in this essay is precisely a type of artifact that allows us to *"stay with the trouble"* (Haraway 2016).

Similar to what Max Liboiron (2021) argues when examining the relationships between the production of scientific knowledge and colonialism, what is at stake in the embroidery presented by Novaes Santos is the necessary understanding that "methodology is a way of being in the world and that ways of being are tied up in obligation" (Liboiron, 2021: 1). Thus, in addition to contributing to the complexification of the notion of collaboration, a central theme of this special issue, *Embroidering Troubles* also extends its contributions to the ethical, epistemological, and methodological dimensions of anthropological practice. From the creative process of fabulation materialized in the embroidery, the author produces an explicitly implicated, responsible, and respectful perspective, highlighting the inseparability of these different dimensions, as well as the potential of artisanal paths, and the ways in which they may allow for the elaboration of responsible forms of knowledge engagements.

In light of this essay, which concludes our special issue, it is possible, from the threads that the author handles in her embroidery, to also revisit the threads that make up the other works presented here. Beyond representations of times of climate urgency, the essays we have gathered are committed to producing *figurations* and *worldings*, in the sense conceptualized by Haraway (2016); that is, they are not metaphorical creations, but material-semiotic productions that materialize *some worlds* and *not others*. Through very distinct artistic and scientific approaches, the many threads that intertwine, connect, and split throughout all the essays, end up also challenging and modifying disciplinary boundaries, persistent binaries, and hierarchies, thus producing diverse, generative, and committed entanglements.

As Haraway underlines, "cynicism is not an acceptable position in the face of the crises that we are in, but staying with the trouble is. And that involves aesthetic, cognitive,

literary, technical, sensual - all with depths of thinking, sensing, feeling, bearing, acting" (Dolphijn, Spitzner, & Head 2023: 111). In the face of the ecological urgency that informs the title of our special issue, and which forms one of the dense threads that run through all the essays discussed here, lies the risky task of performing naturecultures that matter and that materialize other ways of being on a devastated Earth. An Earth that still possesses the potentialities for regeneration and recovery. The threads that permeate this work tell human and more-than-human stories, stories of violence and survival, of attention, affection and creativity; these are stories that choose to stay with the trouble. They are not innocent stories, and yet they are engaged with the promise and the potential of all the other possible worlds that may yet come to be.

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