Eco-Horror:

Facing Climate Change in Minas Gerais, Brazil

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CONTENTS

Abstract

English: Based on participatory fieldwork with government climate science advisors in the Southeastern Brazilian state of Minas Gerais in 2017 and 2018, my dissertation documents the unprecedented and monstrous challenges of addressing climate change amidst rising authoritarianism. I explain how environmental and political disasters, ranging from toxic floods to assassinations, destabilize traditional forms of science and politics. I examine how destabilization erodes boundaries between categories and explore its effects on open and clandestine conflicts taking place within state bureaucracies. I show how the horrors of the climate crisis spur ethical self-reflection among climate analysts, producing a new form of "transversal" ethical thinking. I then trace the creative strategies developed to address this destabilizing horror, such as “Ecosystem-Based Disaster Risk Reduction” (Eco-DRR) and community-based environmental education. My research demonstrates the importance and potential of taking horror seriously and seeing its imaginative potential. My dissertation contributes to science and technology studies (STS), political anthropology, and environmental anthropology by interrogating the new problematizations of the state and science in the era of climate disasters.

Français: Fondée sur une enquête de terrain participatif en 2017 et 2018 avec des conseillers gouvernementaux en climatologie dans l'état brésilien du Minas Gerais, dans le sud-est du pays, ma thèse documente les défis monstrueux et sans précédent de la lutte contre le changement climatique pendant une augmentation de l'autoritarisme. J'explique comment les catastrophes environnementales et politiques, comme des inondations toxiques et assassinats, déstabilisent les formes traditionnelles de la science et de la politique. J'examine comment la déstabilisation érode les frontières entre les catégories et j’explore ses effets sur les conflits ouverts et clandestins qui se déroulent au sein des bureaucraties étatiques. Je montre comment les horreurs de la crise climatique incitent les analystes du climat à une auto-réflexion éthique, produisant un nouveau type de pensée éthique "transversale". Je retrace ensuite les stratégies créatives développées pour faire face à cette horreur déstabilisante, telles que la "réduction des risques de catastrophes basée sur les écosystèmes" (Eco-DRR) et l'éducation environnementale communautaire. Ma recherche démontre l'importance et le potentiel de prendre l'horreur et son potentiel imaginatif sérieusement. Ma thèse contribue aux études des sciences et technologies (STS), à l'anthropologie politique et à l'anthropologie environnementale en interrogeant les nouvelles problématisations de l'État et de la science à l'ère des catastrophes climatiques.

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Introduction: CLIMATE HORROR

"The sight was like nothing I had ever seen before; it seemed to belong not on the earth of human experience but in the pages of some unworldly fantasy."
Amitav Ghosh, *Gun Island*

"I don't know what, but it feels like something is about to break." Looking back at my letters to friends and family, I can see my uneasiness growing. A few weeks after I sent the above line to my parents, I wrote to a friend about how my mind seemed to keep returning to the writings of European Jews who had fled to Brazil in the mid-twentieth century, like Clarice Lispector, Claude Lévi-Strauss, and Vilém Flusser. Something about their experiences of looking for an escape resonated with me. "Maybe I'm being dramatic," I wrote, "but it seems like everyone I meet has a plan to get out."

Something was wrong. In 2017-2018, I was in Belo Horizonte, the capital city of the Brazilian state of Minas Gerais, conducting fieldwork with the *Gerencia de Energia e Mudanças Climáticas* [GEMUC] (the Office of Energy and Climate Change), a team of environmental scientists struggling to address the climate crisis from within the regional state bureaucracy. True to what I told my friend, an increasing number of my conversations with team members revolved around contingency plans. Brazil no longer seemed like the optimistic "land of the future" described by mid-century Jewish refugees (Zweig 1941) that I had secretly hoped to find. Some analysts were considering leaving their government jobs to pursue further degrees, hoping that the added credentials would provide them with more opportunities once things "settled." Others discussed plans for leaving the capital to take positions at remote weather monitoring stations in the countryside. Still others speculated on the possibilities of starting entirely new lives separate from work in climate politics.

As Lucia Cantero (2017) and Ryan Cecil Jobson (2020) note in their annual reviews of sociocultural anthropology, the mid-2010s were characteristically "dark" times globally. Amidst environmental disasters and political corruption scandals, Minas Gerais was no different. When I designed my doctoral research in 2013 and 2014, Brazil had seemed to be brimming with optimism. The national economy was booming, lifting millions out of poverty. The ruling Worker's Party had high approval ratings. Mega-events like the Olympics and the World Cup attracted global tourism. Yet only a few years later, most of my interviews now began with a sigh. "I wish I could show you more," they would say, "but we can't do as much now as we used to. It was better a few years ago."

From 2014 to 2017, most of southeastern Brazil weathered a sustained drought, gradually creating a "water crisis" in Minas Gerais with deep impacts on agriculture, mining, and daily life. Many previously verdant areas in Belo Horizonte turned brown in the dry heat. In some cases, city managers gave up trying to keep parks green and simply paved over dead plants.

Seemingly unrelatedly, President Dilma Rousseff was impeached in 2016 through allegations of *pedaladas fiscais* ["fiscal pedaling"], delaying financial reports to improve the appearances of the national economy. Her predecessor, the enormously popular Lula Da Silva, was imprisoned in the midst of his own 2018 presidential campaign as a part of "the largest corruption scandal ever" (Watts 2017), *Lavo Jato*. Public confidence in the legitimacy of the Brazilian state and democracy palpably dwindled ("Informe 2018" 2018). A few months after telling my parents that "something is about to break," Brazil elected Jair Bolsonaro, a former military captain whose strongest "criticism" of Brazil's 1964-1985 military dictatorship was "that they tortured rather than killed" (Jovem Pan 2016).

Authoritarianism and the climate crisis mutually reinforce each other. They are problems that demand simultaneous attention. Climatic conditions shape sociopolitical ones, which in turn affect environmental policies and practices and vice versa (Reuveny 2007). Anthropologists and others seeking to address these phenomena might ask what forms of environmental and political intervention become possible, or ethical, in the midst of "the existential threats of climate catastrophe and authoritarian retrenchment?" (Jobson 2020, 1).

In this dissertation, I explore the ways that anthropology can address these terrifying circumstances by engaging with the horror genre. At its core, my research is guided by an open yet pressing question of how to conduct oneself ethically when the world seems to be ending. My argument is that our collective commitment to pursuing just and livable futures demands that we engage with horror. This engagement is frequently difficult. It is tempting to "deflect" from horror (Diamond 2008, 53), to render horror palatable or manageable in ways that betray how vital the task is. At times, approaching horrific experiences *as* horrific may interfere with the purported scientific goals of analysis and clarification. However, as I will demonstrate, an honest account of the sheer monstrosity of the climate crisis and authoritarianism resists neat clarification. Remaining attentive to the contours of the contemporary climate situation thus demands an alternative approach from that of traditional science.

Horrific Realism

Many anthropologists focusing on "dark" topics in the 1980s such as violence and oppression (Ortner 2016) relied on horror tropes in their ethnographies. In his studies of the Putumayo, Michael Taussig describes a surrealist "culture of terror" (1987) wherein "terror dissolved certainty every bit as much as it preyed on one's heartfelt desire to find its secret

order" (1991, 9). Taussig turns to surrealist authors such as Georges Bataille and Antonin Artaud to help him effectively portray the terrifying and murky realities and violence of (post)colonial Columbia. Building on this work, Lisa Stevenson (2019) has portrayed how the communication of fear can simultaneously rupture and compose new forms of community and kinship. Relatedly, Eve Tuck and C. Ree (2016) turn towards horror films as a vantage point from which to observe the injustices of violent colonization. These varied texts present the experience of horror as deeply entangled with harm, oppression, violence, and darkness.

Brazilian writers have also used horror tropes to address sociopolitical oppression and authoritarianism. Brazil's military dictatorship sparked the imagination of Brazil's most enduring horror icon, Zé do Caixão, a character created by José Mojica Marins who appeared in a series of films and television shows from 1964 to 2008 (fig. 1). A satanic undertaker obsessed with eugenics and creating the perfect man through sexual violence, Zé do Caixão dramatizes the religious and gendered tensions that framed the dictatorship. Despite being censored by the dictatorship, Marins' films bear an ambiguous relationship to authoritarianism. On the one hand, Zé do Caixão's violent obsession with "the continuity of blood" is a critique of the heteronormative impulses of Brazil's military regime (St-Georges 2016). At the same time, however, his immoralism and Satanism gave form to precisely the kind of horror that the dictatorship feared, that a turn away from Christian tradition would inevitably lead to monstrosities like Zé do

Figure 1: Zé do Caixão (Marins 1967)

Caixão (Monteiro 2009). Either way, Zé do Caixão demonstrates the potential for horror to thematize the diffuse anxieties of sociopolitical and moral conflict.

While the dark horror of Marins' morality tales preserves a clear division between good and evil, a related but distinct approach to horror emphasizes ambiguity and weirdness. Sarah William's reflexive study of anthropologists uses Julia Kristeva's analysis of "abjection" (1984) as a tool for "mak[ing] ethnographic a thing that is impossible, intolerable, unthinkable" (1993, 67). Abjection is the horrific experience of the disruption of order. Abjection provides a form of realism that brings empirical attention to experiences that seem to lack a clearly defined object, or "a 'something' that I do not recognize as a thing" (Kristeva 1984, 2). Through the concept of abjection, Williams describes moments lacking any kind of organizing schema, even a simple division between a subject and an object. Rather than presenting horror as a synonym for evil, Kristeva's horror undermines categories. This form of horror is a way to reflect on the limits of thought itself. In this sense, horror is fundamentally *weird*.

Kristeva's analysis of abjection loops back into anthropology through her reading of Mary Douglas (Kristeva 1984, 65–67). Douglas's *Purity and Danger* (2002) builds on and critiques the Durkheimian and Kantian understanding of thought in which understanding proceeds through the organization of experience into conceptual schema created by the human mind. In this tradition, concepts serve as the privileged tools that "synthesize" experience into comprehensible parts (Kant 1965; Durkheim 1995; Deleuze and Guattari 1996, 20). In contrast, Douglas (2002) focuses on the edges of experiential categories. Rather than present a world that is neatly organized, *Purity and Danger* hones in on the concrete reality of entities and experiences that challenge the limits of schemas.

Diverging from Douglas' emphasis on the ongoing processes of purification, Kristeva emphasizes the "danger" of purification. By showing how social and conceptual borders need to be practically maintained, Douglas provides Kristeva with the necessary groundwork to define the abject as that which horrifically violates those borders, "disturb[ing] identity, system, order" (1984, 4). Building on Kristeva, Williams presents horror and abjection as idioms for discussing experiences which escape the neat, clean, and orderly categorization of conceptual thinking. Abject horror is thus more closely linked to the affect of overwhelming sublimity than it is to fear.[1]

The capacity of abject horror to reveal the limits of thought thrives in the work of the Jewish Czech-Brazilian philosopher Vilém Flusser. In his memoir, Flusser writes that "The experience of groundlessness cannot be conveyed in literature, philosophy, and art without being falsified. Groundlessness can only be circumscribed in these forms, so that it may be partially grasped" (2017, 21). Struggling to make sense of his flight from Prague to São Paulo in 1939 and his evasion of the military dictatorship in the 1970s, Flusser's worka are a dazzling array of efforts to make sense of the incomprehensible and inexpressible. Instead of writing a straightforward account of the Holocaust, fascism, or the 1964 military coup, Flusser's writing feattures unexpected figures that allow him to play with the limits of thought. His *magnum opus,* a pseudo-study of *Vampyroteuthis Infernalis*, the "vampire squid from hell," treats concepts, the key human tool for making sense of the world, as "nets" or "traps" for gathering up the world (Flusser 2011c, 83). Ultimately, the eruption of horror reveals that those nets will fail (Flusser

[1] "Sublimity" here is to be understood in the sense presented by Immanuel Kant as the experience of "the presentation of an indefinite concept of reason" (1987, 98). In other words, the experience of the sublime is the limit of reason. Taking the sublimity of horror seriously would thus lead anthropology away from the priority of *a priori* concepts and towards what Catherine Malabou (2016) calls the "relinquishment of the transcendental," a reconsideration of thought itself as mutable and material.

2011c, 23). Rather than continually crafting new concepts, Flusser encourages his readers to consider horror without the support of understanding, allowing monsters to "emerge alive" (2011c, 124).

In this dissertation, horror serves as an anti-concept (Wald Forthcoming). It highlights the limits of conceptual knowledge without abandoning the necessary realism to acknowledge that *something* is out there. As the philosopher of horror Eugene Thacker notes, horror undermines "philosophy's most basic presuppositions" (2015, 3:131), revealing that our reliance on fundamental logical principles fails to provide insight at moments when we encounter the limits of thought. The climate crisis is one of those moments. Guided by Thacker, along with Flusser and Kristeva, I use efforts to address the climate crisis in Minas Gerais as an exploration of the open abyss created in the wake and anticipation of disaster.

The horrors of today overwhelm our collective coping mechanisms. The scope, speed, and complexity of climate change challenge even the most stable institutions, let alone governments undergoing radical transformations. As Ulrich Beck (1992) noted in the early years of awareness about global ecological disasters, there are many features about climate change that exceed traditional political frameworks. In the past, political orders have dealt with a variety of hazards. However, Beck notes that the majority of these past risks were concretely perceptible. This does not imply that the risks of the past were any easier to address, but the challenge of identifying these risks was typically settled through normal perception. By contrast, "the risks of civilization today typically *escape perception*" (Beck 1992, 21). Atmospheric gases, subterranean flows, and microscopic pathogens creep in from all directions. While material, they largely avoid direct, unassisted perception, hence opening them to interpretation and debate over their very existence.

This is not the end of the world. After all, the planet will keep traveling its orbit without us, and life would likely continue past any possible human extinction. Furthermore, violent colonization and other genocides have already brought about the apocalypse for many Indigenous peoples around the world (Bessire 2014). However, many observers today may be feeling as if this is the end of *worldhood*, that sense that everything exists alongside one another in an ordered cosmos.[2] Experiencing the end of worldhood means losing the sense that the world coheres to itself or some kind of rational structure. In other words, the end of worldhood is a facet of abject horror.

Further complicating the ambiguity of climatic risks, today's challenges are not always material or confined to domains comprehensible by the natural sciences. While addressing climate change relies heavily on input from a variety of material sciences, global warming extends tendrils into many other domains. Part of the challenge and the unthinkable horror of climate change is that it and any potential responses to it exceed the strict frameworks of "nature." It is an unprecedented event that challenges the very idea of natural science, which relies on replicable experiments and inductive reasoning. Vilém Flusser notes:

> 'Only once,' is an expression, which the scientific spirit does not accept. It cannot accept it, because science stops functioning if it utters this expression. Science is a mental discipline that investigates phenomena that are at least theoretically repetitive. Sciences drowns when confronted with a solitary and irrevocable phenomenon. (2014b, 39)

This is not to say that science is no longer useful. Scientific and technological apparatuses are vital to identifying and addressing climate change. However, as we shall see, Flusser is correct in

[2] In more technical philosophical language, one could turn to Heidegger's definition of "worldhood" as an "ontologico-existential concept" of "that 'wherein' a factical Dasein as such can be said to 'live" (1962, 93). In other words, "worldhood" does not designate any object like a planet or set of objects that comprise its contents, but rather refers to the structure of existence ("Being") which allows for all those entities to inhabit a shared world.

noting the sharp limits to what questions science can answer about these kinds of radical, unanticipated cataclysms.

The limited ability of science to make predictions particularly comes into focus in sociotechnical challenges like governing climate change. In designing policies to address climate change, many government analysts refer to a standard model of policy evaluation called the "policy cycle." The policy cycle was designed to be a generalizable model for crafting and evaluating policies. It has five steps that can repeat indefinitely: the identification of problems, formulation of policies, choice of a plan, implementation, and evaluation (Howlett and Ramesh 2003). In principle, the policy cycle allows for a methodological approach to directing government resources. First, the involved population is consulted to identify a problem that needs to be addressed. Then policy makers consider the available options that would mitigate that problem. Those same policy makers, or perhaps a different group, then select one of the possibilities to enact. After implementing the plan, analysts evaluate its effectiveness. In part, this evaluation might identify new or remaining problems that need to be addressed, thus restarting the cycle.

The radical ambiguity of today's horrors complicates the policy cycle at every stage. Who gets to identify a problem when democratic institutions are weak or crumbling or when the diffusion of environmental risks are unpredictable or unmeasurable? What kinds of responses will be considered when the possible technological responses are still being researched? "Everywhere science and technology overflow the existing frameworks. The wave breaks. Unforeseen effects multiply" (Callon, Lascoumes, and Barthe 2011, 9). Without knowledge about the future consequences of political shifts or massive climate change, we are without a firm framework to navigate our way forward.

Of course, we are not entirely in the dark. A figure looms on the horizon, making our situation all the more horrifying. Many of the planet's most vulnerable populations have already begun to directly experience the terrors of climate disasters. Throughout the global south, the ramifications of resource extraction and environmental contamination damage the wellbeing of ecosystems and communities alike. The damages largely impact those with fewer resources before more well-off communities are affected (Guimarães 1991). While the ultimate consequences of climate change are still forming, its effects are already here.

The current and future effects of the climate crisis challenge our capacity to attend to the "forces of unthinkable magnitude that create unbearably intimate connections over vast gaps in time and space" (Ghosh 2016, 63). We need new forms of imagination to make sense of the horrors we are living through and will continue to encounter. "Eco-horror," a subgenre of horror which revolves around stories of ecological collapse (Booth 2019), can be a useful tool for exploring the particular horrors of the climate crisis (Lysgaard, Bengtsson and Laugesen 2019). To that end, this dissertation draws inspiration from eco-horror to elucidate aspects of the climate crisis that undermine concepts of science, politics, and ethics.

The Science of Climate Horror

When the New York Times bestseller *The Uninhabitable Earth: Life after Warming* begins with the ominous sentence: "It is worse, much worse, than you think" (Wallace-Wells 2019, 1), the warning is literal. While it might seem bold, it applies to *you*, the reader. Wallace-Wells is able to make this bold claim because of how climate science works. With a system so unpredictable and so unprecedented, the reality is that the situation is worse than anyone can genuinely claim to know. However bad we think the problem is, it is probably much worse.

To understand what makes the climate crisis horrifying, it is important to present a schematic overview of what we know about climate dynamics. To this end, a small detour into complex systems analysis and some of the basic mathematical principles that underlie this work is necessary[3]. The best tools available to understand the climate crisis take us to the limit of knowledge. In other words, climate experts can tell us just how much we do not know about the planet's future as we increase global average temperatures.

At their most basic, complex systems are characterized by the aggregation of multiple, diverse and interacting actors within a system. These actors interact with each other "locally," meaning that each interaction is, to some degree, independent of other interactions.[4] Pendulums provide a simple example. Pendulums are often used in introductory physics classes to demonstrate the conservation of momentum. If one removes friction from a pendulum's pivot, the system is highly predictable. If it takes one second for a pendulum to complete a swing after being dropped, after half a second, it will be at the bottom of the swing. After a full second, it will be at the top of the other side of the swing, and so on. One could perfectly predict the location of the pendulum at any time. The pattern would never break.

The pendulum example illustrates a simple, mechanistic system. Its dynamics are linear, consistent, and predictable over time. To illustrate a complex, non-linear system, one would only need to add one new element: another pendulum attached to the end of the first. The path of this

[3] While mathematical models may not be a typical topic for anthropology, Paul Kockelman has demonstrated that computer algorithms can offer a vantage for the observation and modification of "ontologies," understood in the computer science sense of "assumptions that drive interpretations" (2013, 34). In other words, computer algorithms provide a glimpse into the objects and relationships of concern for particular communities. Furthermore, Andrea Ballestero (2015) has demonstrated that the construction of formulas to monitor and govern the environment can incorporate moral discourses. As an anthropologist, what interests me is not the felicity or accuracy of complex systems theory's predictions, but rather the forms and types of data related through its modes of inquiry and the afterlife of these inquiries as they are enacted in practice.

[4] Various scholars have used complex systems analysis in their approach to social theory, anthropology, or philosophy. My explanation of complexity is indebted to these authors (Prigogine and Isabelle Stengers 1984; Lansing et al. 2012; Deacon 2013; DeLanda 2013).

"double pendulum" can also be mathematically described with perfect accuracy. However, the interaction between the two pendulums causes the double pendulum to be "initial condition sensitive," meaning that infinitesimally small variations in its starting position cause dramatic changes in its eventual path. While not unpredictable in principle, the double pendulum is much more complex and therefore difficult to predict in practice (fig. 2).

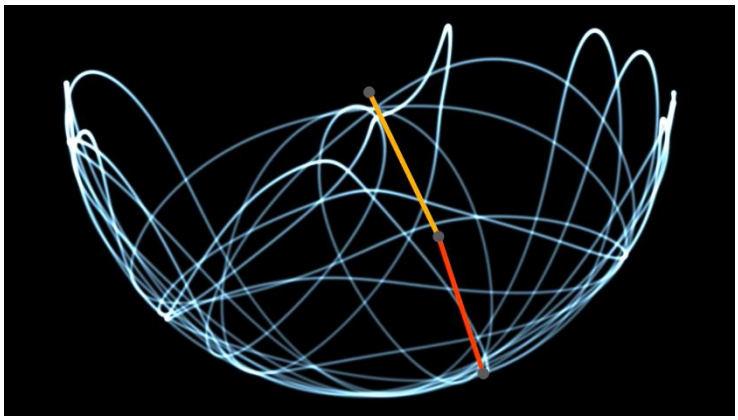

Figure 2: Simulated path of a double pendulum (Paul 2010, 28').

The double pendulum one of the simplest examples of a complex "chaotic" system. The double-pendulum only moves in two dimensions: up-down and left-right. More complex systems can have any number of dimensions. An ecological system, with significantly more dimensions and actors than two pendulums, is vastly more complex. Modeling the elements of an ecological system can be a serious computational challenge, straining the limits of processors if they are not carefully calibrated to reduce the processing load (Eppinga et al. 2009).

There are two ways in which chaotic systems can become predictable. The first is by reaching "equilibrium," or a stable systemic state. At equilibrium, a system will no longer change. Predicting the exact path of a drop of water flowing down a funnel may be difficult, but one can confidently predict that the water will flow to the bottom and therefore reach equilibrium. Chaotic and complex systems may have a number of possible equilibrium states. At these points, the behaviour of the system seems to settle down and become predictable.

Ecological and biological systems are typically part of a subset of complex systems referred to as "complex adaptive systems" characterized as being "far from equilibrium," meaning that the system is unlikely to settle into a singular, final position (Levin 1998). There is a second method of prediction to address such systems. Mathematicians have developed tools for predicting how unpredictable a system will be, as opposed to predicting the state of the system at any particular time. For example, if we begin two simple pendulums (not attached to each other) at different, infinitesimally close starting points, their paths may remain effectively identical or slowly diverge. If we conduct the same experiment with two double-pendulums, the paths of the system will diverge fairly quickly, because the double pendulums are chaotic. Mathematically, this rate of divergence between two infinitesimally close starting points is referred to as a "Lyapunov exponent" and serves as "a quantification of the degree of instability of the system" (Solé and Bascompte 2006, 47).[5] The value of the Lyapunov exponent can be measured for any system through the use of computer models (Solé and Bascompte 2006, 48), allowing modelers to make observations about whether or not a system will become unpredictable.

Complex systems analysis of climate models does not yield linear predictions of the next time it will rain or the temperature next summer. Rather, it describes general trends, possible equilibrium states, and increased likelihoods of extreme, unpredictable weather events (National Academies of Sciences 2016). In essence, tools like Lyapunov exponents allow systems analysts to predict their own inability to predict a system. The increasing temperature of the planet moves the system further away from equilibrium, resulting in a situation where we know, with high confidence, that we do not know what the future will look like.

[5] Formally, the Lyapunov exponent is represented as λ in the equation: $\delta(\epsilon) = \epsilon e^{n\lambda(x_0)}$, where x_0 is the system's starting position, n is the number of iterations, and ϵ is the small difference between two hypothetical starting positions. Lyapunov exponents greater than one indicate a chaotic system, while negative exponents indicate that a system will reach equilibrium.

I found myself deeply unsettled when I learned about the complex dynamics of climate change. Of course, I was aware of global climate change and knew that it was threatening, but working through the details of its complexity and the potential for vicious feedback loops, I was overcome with dread. My experience was not unique. A tweet from the seismologist Lucy Jones expressed similar sentiments. After talking with her son, a climate scientist, Jones compared her career studying earthquakes with her son's work on climate change: "Earthquakes become less frightening as you learn more about them. Climate change becomes more frightening as you learn more. What is coming scares me" (2018).

An Ethnography of Climate Horror

This dissertation attempts to chart the uncertain territories of climate change in the twenty-first century through an ethnography of scientists, analysts and technicians working to address climate change despite the institutional ground beneath them falling away. The people I worked with were part of the *Gerencia de Energia e Mudanças Climáticas* (GEMUC), or the Office of Energy and Climate Change, part of the state's Secretary of the Environment and Sustainable Development, the primary environmental institution of Minas Gerais, Brazil. For these scientific analysts developing climate policy in the year leading up to the election of Jair Bolsonaro, the horror was palpable. Every day they received new estimates of the catastrophic damage of global warming and news of local environmental disasters and corruption allegations. Through ethnography, a careful, in-depth study of the day to day lives of these government workers, I hope to provide a window into efforts to combat the horrors of climate change. My work also illuminates the stakes of the horror and shifting contours of the situation. In trying to understand solutions, this dissertation reveals just how horrifying the problem really is.

I did not arrive at this research problem out of pessimism. On the contrary, I began my graduate career researching ethanol biofuel production out of a desire to highlight efforts to counteract or escape the horrors of climate change. With background training in moral and political philosophy, I was curious to see how the abstractions of ethical thought shaped debates about the regulation of speculative technologies. In other words, I was hoping to conduct what Joel Robbins calls an "anthropology of the good," an "[exploration of] the different ways people organize their personal and collective lives in order to foster what they think of as good, and to study what it is like to live at least some of the time in light of such a project" (Robbins 2013, 457).

In early stages of the project, I attended the 2014 Berkeley Bioeconomy Conference, an annual meeting of multidisciplinary researchers convened to discuss new biotechnological products. Held in a recently renovated building at the University of California, Berkeley, the conference was funded by BP, the same company which had paid for the building. In exchange, a BP representative was given prime speaking time to explain how BP's funds were being directed towards "environmentally sustainable" projects like biofuels. It was easy to be cynical about the pronouncements of an oil company claiming to be in favour of a general transition away from their most profitable product.

It was more difficult, however, to remain cynical about the glowing promise of new technologies that looked set to provide a cleaner, more vibrant future. Like many of the speakers and other attendees at the conference, I wanted a way out from the stifling confines of catastrophic climate change. Soaked in the optimism of the event, biofuels genuinely seemed like a plausible escape route.

It was then that I first heard discussion of Brazil as an exemplary model of working with biofuels made from sugar. Brazil has explicitly promoted biofuel production since the formation of the *Instituo do Açúcar e do Álcool* in 1933. Since then, Brazil has gone through waves of regulation and deregulation in response to shifts in the global sugar market, oil prices, and farming technology (Moraes and Zilberman 2014). In response to the oil crisis of the mid 1970s, Brazil initiated *Proálcool*, a national program dedicated to promoting the use of ethanol biofuel. Brazil also became a leader of "flex-fuel" ethanol blend automobiles in the early 2000s. Today, researchers in Brazil seek to continue producing biofuel from sugarcane through a variety of genetic technologies (Mazzafera 2015). Although not yet realized, they hope that genetically modified sugarcane will be the key to displacing petroleum products.

Following the Bioeconomy Conference, I began tracing a network that would allow me to study the regulation of these speculative biotechnology projects, which led to a fortuitous meeting with a visiting professor from the Universidade Federal do Minas Gerais. At his suggestion, I spent the following summer in Belo Horizonte, the capital of Minas Gerais, to improve my Portuguese and get to know the region.

The name "Minas Gerais" literally translates as "general mines," and this simple interpretation accurately represents the state's current and historical reliance on extractive mining, largely for gold, gems, and iron. Flying into Belo Horizonte, I was struck by the open

expanses of rolling hills punctuated by the steep ravines of abandoned pit mines, some starting to be reclaimed by the native savannah grasses, others still showing the deep red soil. The state is primarily divided into two ecosystems (fig. 3). In the north and west, Minas Gerais is part of the Brazilian *cerrado* biome, a massive arid expanse of savannah grasses. The soil in this region is generally acidic, which makes agriculture difficult, although it has produced distinctive strains of coffee prized throughout Brazil. The *Mata Atlantica*, a tropical rainforest, lies to the South and East, hugging a small mountain range separating Minas Gerais from the Atlantic coast.

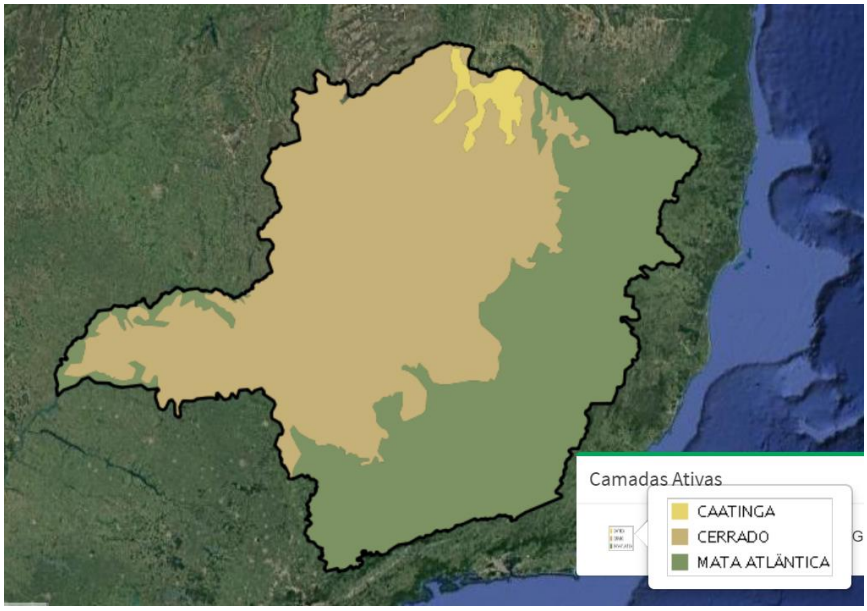

Figure 3: Biome map of Minas Gerais provided by Sisema-IDE

The forest is currently difficult to spot. Ominously, the name "Minas Gerais" is actually a shortening of the original name, "Minas dos Matos Gerais," "mines of the general forests." As Portuguese and later Brazilian mining and agriculture intensified, the forests were stripped from the land and, consequently, the name. Like the *cerrado*, much of the *Mata Atlantica* has been converted into mining or agricultural production since Portuguese colonization in the sixteenth century. The dominance of mining industries in dictating economic and political priorities continues to leave a lingering trace on both the land and contemporary Mineiro politics.

Environmental regulation in Minas Gerais is overseen by the *Secretaria de Estado de Meio-Ambiente e Desenvolvimento Sustentável* (SEMAD). According to commonly told history, increased international pressure on Brazil to care for its environment following the 1972 United Nations Conference on the Human Environment in Stockholm led to the 1981 formalization of state-level environmental agencies (Guimarães 1991; Lago 2007). This history gives the impression that the creation of environmental agencies throughout Brazil was a point of entry for "foreign policy into domestic affairs" (Starling et al. 1998, 35).

However, this story understates the presence of environmentalism and environmental law already present in Brazil and Minas Gerais since at least the 1930s, when a wave of bureaucratic reforms included new laws for forests, water, mining, fishing, and pollution (Starling et al. 1998, 36). Minas Gerais in particular founded its first environmental agency, the *Diretoria de Tecnologia e Meio Ambiente* (DTMA), in 1975. Due to the scope of the Mineiro mining industry, the DTMA was created as a technical support to reduce pollution and support the development of cleaner practices. In contrast to the conservation focuses of later environmentalism, the DTMA worked closely with industry. According to the *Diretrizes Basicas do II Plano de Governo de Minas Gerais,* a 1976 government publication clarifying its role, the DTMA was part of a project of "rationalizing" resource use, promoting a "scientific" model of development for the state while also working to "internalize the environment at all levels of decision making."

Through a cascade of changing acronyms and bureaucratic restructurings, Minas Gerais eventually arrived at its current structure of environmental governance. At the top, the Secretary of Environment and Sustainable Development oversees the enforcement of environmental licensing laws and other aspects of regulation. It is supported by three subordinate organizations: the State Forest Institute, the Mineiro Water Management Institute, and the *Fundação estadual*

do meio ambiente [FEAM]. Under FEAM, or the "State Foundation for the Environment" is GEMUC, the organization that I worked with. In many ways, FEAM is the direct inheritor of the DTMA's mission. When it was founded in 1989, FEAM's initial project was to develop better methods of pollution management. As one FEAM analyst explained to me, FEAM's projects frequently operate on the border of human impacts on the environment. This means that unlike the Forest Institute, which would like to simply create environmental reserves to minimize human impact, FEAM must work intimately with anthropogenic processes, such as industrial pollution or energy consumers. With one foot in institutional politics and another in environmental science, FEAM provides a fascinating case study of the unfolding of environmental politics that seeks to recreate the conditions of economic and industrial development within a more sustainable model.

Methodology

This research was guided by three methodological impulses: studying up, second-order observation, and a focus on problematization.

Studying Up: Classical anthropology is characterized by ethnography, writing based on long-term, personal engagement with particular societies, frequently in colonized or post-colonial locations. During the ongoing process of decolonization, anthropology underwent a series of re-evaluations, most notably discussed in *Writing Culture* (Clifford and Marcus 1986) and *Anthropology and the Savage Slot* (Trouillot 1991). These two works explored the shifting landscape of anthropology and the necessity to rethink ethnography to remain relevant to contemporary concerns. This rethinking of anthropology is frequently called the "reflexive turn." People from colonized and formerly colonized populations were also calling for anthropology to

decolonize by critically reconsidering the political roles of anthropologists in a world historically characterized by colonization (Harrison 1997).

Methodologically, many anthropologists have responded to the reflexive turn and calls for decolonization by turning to a method presented by Laura Nader. In "Up the Anthropologist," Nader provides a blueprint for an inverted anthropology: "study of the colonizers rather than the colonized, the culture of power rather than the culture of the powerless, the culture of affluence rather than the culture of poverty" (1972, 289). "Studying Up," as she terms this method, is superficially quite similar to classical ethnography as described by Malinowski in *Argonauts of the Western Pacific* (2013). The ethnographer selects a particular group, observes them in their quotidian life, participates in their activities and engages with them to gain a glimpse of their perspective. The fundamental difference for Nader's "studying up" is that powerful institutions substitute for colonized peoples as the objects of the study. The goal of this kind of substitution is not to forget about the oppressed, but rather to produce knowledge that could, in principle, be useful for understanding the institutions' impacts on populations excluded from places of power (Nader 1972, 294).

In line with Nader's suggestion, this dissertation joins other anthropological inquiries into the daily functions of state institutions (Abélès 2001; Gellner and Hirsch 2001; Fassin 2015). By agreeing to work as a FEAM *prestador de serviço* (service provider) assisting in translations and other logistics, I was given a desk and a computer in GEMUC's workspace. From there, I was able to observe daily life in the state capital buildings and conduct interviews with climate analysts.

Second-Order Observation: As a human science, anthropology observes people who are themselves observers. Sociologist Niklas Luhmann terms this reiterative process "second-order

observation," or the "observation of observations" (1998, 48). Second-order observation is epistemically unique because it recognizes the centrality of contingency in the act of observation. In other words, second-order observation reveals that many different first-observations may be possible depending on the conditions surrounding the first-order observation. Second-order observation recursively finds that "Everything becomes contingent whenever what is observed depends on who is being observed" (Luhmann 1998, 48). As the anthropologist Niklas Langlitz explains, "What the first-order observer perceives as natural and necessary appears to the second-order observer to be artificial and contingent" (2007, 7). Second-order observation produces a kind of grounded relativism. It gives a story to facts and tangible substance to the philosopher Gaston Bachelard's dictum that "facts are made [*les faits sont fait*]" (1971).

One objection to a focus on second-order observation is that it might be unduly relativistic. However, that facts have stories that are contingent on their observers does not imply that facts are "made up" as if they are merely creations of the human mind. The contingent nature of second-order observations rests upon two axioms. First, observations are never fully reducible to a simple material object or ideology. Second, the existence of a story about an observation does not necessarily mean that the observation is disconnected from an external phenomenon. The philosophers Chantal Mouffe and Ernesto Laclau provide a clear explanation and examples:

> The fact that every object is constituted as an object of discourse has *nothing to do* with whether there is a world external to thought, or with the realism/idealism opposition. An earthquake or the falling of a brick is an event that certainly exists, in the sense that it occurs here and now, independently of my will. But whether their specificity as objects is constructed in terms of 'natural phenomena' or 'expressions of the wrath of God', depends upon the structuring of a discursive field. (2001, 108)

Because the climate crisis is so ambiguous it can be interpreted in multiple ways (Beck 1992, 29). These interpretations are part of the story of the climate crisis. By observing the observers of

the climate crisis, my research explores the emerging facets of the climate crisis without presuming to know what I would find in advance.

While all observations may include contingencies, there are practical limits to how contingent observations can be in an environmental crisis. The limits on the contingency of observations were a frequent concern of the scientists struggling to understand the risks of climate change. Luhman himself was aware that the growing ecological crisis would necessitate vigorous first-order observation to accompany the second-order observations traditionally carried out by sociologists and anthropologists (1998, 77). Rather than remain circumscribed within entirely human domains of "society" or "economy" which are methodically purified of non-human elements, an anthropology of climate change must remain open to first-order observation and take seriously the roles of non-human and non-living entities (Latour 1993; Kohn 2013).

Another objection to second-order observation is that it smuggles in a kind of methodological elitism. There can appear to be a separation of the naïve first-order observers who fail to recognize the true contingency of their work from the enlightened second-order observer that reveals just how misguided those deluded first-order observers have been. Second-order observation might thereby provide the social scientists with a kind of "speaker's benefit," an inexplicable exemption from a problem they diagnose in everyone else (Foucault 1990, 1:6).

This criticism may lead some to abandon the idea of second-order observation. However, in my work, I was struck by the ubiquity of the practice of second-order observation. Within the bureaucracy, it seemed that everyone was watching everyone. As working groups competed for resources, they would carefully monitor each other's activities to ensure that their work was presented to colleagues in the most flattering way. This reliance on observing other observers and acting as if one is always being observed led me to wonder if my work was not second-order

observation, but *n*th-order observation; one where I was observing observers observing observers *ad infinitum*. The possible elitism of second-order observation was therefore avoided, not by abandoning the method, but multiplying it and recognizing its operations everywhere.

An important aspect of multiplying second-order observation was noticing the ways that I was being observed by others. Two important examples stand out. First, the fact that I am a white male scholar from the global north meant that my involvement with the team of climate advisors presented their work in a new light. On multiple occasions, a team member would highlight my participation to audiences to emphasize the prestige and cosmopolitanism of their work. Second, the ongoing corruption investigations, which I describe in more detail in chapters 1 and 4, meant that my observations were viewed with a level of suspicion. The potential that I might leak information to journalists or to political enemies cast a pall over many of my interviews. To mitigate this issue, I chose to avoid questions about corruption directly. In these two ways, recognizing the ongoing importance of second-order observation for my collaborators shaped the domain of our conversations.

Anthropology of the Contemporary: So, what can an anthropologist contribute if second-order observation is not the unique domain of human scientists? Are we only acting as relays for the thought already conducted by informants? I frequently found myself feeling ten steps behind in discussions. Events and procedures that were common knowledge for the analysts were entirely new to me, and my fumbling questions in accented Portuguese were often met with confusion or a slight laugh. How could I be asking such idiotic questions? While the situation improved with time and learning, I continued to take advantage of the "idiotic" strategy in interviews (Stengers 2005, 995) to expose points of ambiguity.

By asking analysts about the basics of their work, I was able to pinpoint their central concerns and reveal moments of "problematization," those points where the taken-for-granted thinking is inadequate. An attention to problematization is the hallmark of Michel Foucault's life work and anthropologists inspired by him (Rabinow 2003). Central to the preoccupation with problematization is the concept of a "problem." Foucault did not necessarily use "problem" in a pejorative sense. Rather, much like for the American Pragmatists, problems are those moments that agitate and prompt thinking due to the shortcomings of preexisting modes of thought (Rabinow 2011). A history of problems is therefore a pragmatic history of thinking that notes the ways in which concepts and practices come together to form "apparatuses" that respond to particular problems.

Many writers have incorrectly used the term "problematization" as a synonym for "critique." However, problems, unlike critique, are not created by writers. Rather, they are events (Rabinow 2003, 55) that emerge at particular times through the confluence of heterogenous factors. Through strategic "idiocy," an anthropologist might reveal a moment of problematization, but the anthropologist did not create the problem.

One of the challenges studying problematization is taking all the various elements that might be involved in the creation of a problem seriously without presuming the solution in advance. After all, if the solution could be known in advance it would not be a serious problem. The largest problems, the most horrifying, are the ones where we will need to be the most open-minded and creative about its possible solutions.

Throughout his life, Foucault sought to create a "history of the present" that accounted for the concepts and institutions of his time, by showing how the questions posed by problematizations had been answered in practice. For instance, the challenge posed by the

increasing demand for industrial labour in combination with mechanized views of biology led to the kinds of penal practices examined in *Discipline and Punish* (Foucault 1995). However, for an anthropological study of present conditions, the questions posed by problematizations remain unanswered.

Conducting an "anthropology of the contemporary" means observing the multitude of historical and emerging phenomena that intersect as problematizations are addressed (Rabinow 2007). With the horrors of climate change, problematization is the product of changing environmental conditions, economic practices, scientific expertise, democratic institutions, the vitality of the flora and fauna of the ecosystem, and an untold host of other factors. Additionally, the colonial history of Brazil has left lasting scars on the landscape and population that continue to have ramifications.

Problematizations preclude the use of monolithic explanatory categories in which everything can be reduced to a mere example. In this sense, study must be casuistic rather than deductive, proceeding from cases that may result in the emergence of general categories (Jonsen and Toulmin 1989). This approach is contrasted with one which begins with general hypothesis, where fieldwork ultimately furnishes confirming examples (Laidlaw 2014, 40–41). My fieldwork did not confirm any pre-existing philosophical systems. Rather, I will show that it "[brought] forth a future anterior that is not calculable from what we now know, a future that surprises. Ethnography thus becomes creative, producing something that didn't exist before. Something beyond codified expert formulas" (Fortun 2012, 450).

Chapter Outlines

Between my optimistic arrival in Belo Horizonte in 2014, when I hoped to study the production of biofuels, and my fieldwork with GEMUC beginning in 2017, Brazil and Minas Gerais underwent a series of devastating disasters. The devastation wreaked by these disasters decimated climate analysts' confidence in their capacity to proactively create a better future. Put on the defensive, they scaled back a number of their projects. On my first day with GEMUC, I asked an analyst about their plans for biofuel. "Oh, we don't do that." Confused, I tried to clarify. Was it actually a different office? Had I been misled? "We used to, but not any more. We stopped," the analyst curtly explained to me in a matter-of-fact and slightly resigned tone. His abrupt response left little room for my questions. That was the past.

My first days with GEMUC were spent trying to understand what had gone wrong. The possibilities were overwhelming. My first impulse was to separate the disasters into distinct categories. On the one hand, there were environmental disasters like mine collapses. On the other hand, there were political disasters like impeachments. While the bestiary of disasters was crowded, I thought I could distinguish the various monsters and keep them in their separate conceptual containers. However, what I found in practice was that the various disasters were more like a hydra, all leading back towards each other and intermingling. In chapter 1, I present a montage of these disasters as a window into the disorientation they produced. I argue that these disasters are not reducible to a singular event or category, but that they resonate by amplifying each other's effects, reducing capacities to respond, and producing an overarching atmosphere of dread.

In chapter 2, I present the efforts of state climate analysts to account for these disasters. Guided by their own reflexive observations of their roles as "boundary workers" operating at the frontier between science and politics, I trace how the concrete practices of GEMUC analysts

expose the limits of "science" and "politics" as concepts. New forms of self-reflexivity emerged as the analysts worked on a greenhouse gas emissions inventory and state vulnerability assessment. Both projects specifically relied on the holism of complex systems analysis to forge the connections between seemingly disconnected phenomena, without regard for the purported separation of "nature" and "culture." However, despite these lofty ambitions, I show how rendering environmental governance as a problem of complex systems presents its own forms of problems for climate analysts.

In chapter 3, I consider an alternative to the holism of complex systems analysis. In what I call "emetic inquiry," I consider moments of antagonism and strict differentiation that emerged in conversation with Indigenous Krenak activists and entomologists studying mosquito microbiomes. Through these two cases, I argue that inquiry into the climate crisis ought not fear moments of liminality, conflict, exclusion, or, more broadly, enmity. The climate crisis is characterized by deep divisions, like those between settler states and Indigenous communities or between human beings and virus-infected mosquitoes. These divisions limit knowledge and ethics. Rather than attempt to overcome these divisions and create a harmonious whole, I present emetic inquiry as an alternative that acknowledges and respects these divisions.

While the horrors discussed in the first three chapters are all monstrous in their scope, chapter 4 investigates more mundane and insidious dimensions of climate governance. Through ethnographic observations of bureaucratic labour, I analyze "minor blockages" (Stavrianakis and Rabinow 2018), the easily overlooked challenges that can block political action. In their daily efforts to address the horrors of climate change, the analysts frequently encountered bureaucratic obstacles that made their work unfeasible. This bureaucratic deadening, so well documented by

Kafka novels, is another kind of horror, one that must be understood if Brazil is to have effective regulatory agencies.

Chapter 5 turns away from the problems of climate governance and towards the creative efforts emerging to address them. I describe a new mode of ethical thinking organized around "transversality." Drawn from the contributions of the former Secretary of the Environment Marina Silva, transversality has its intellectual roots in the work of the Liberation Theologist Leonardo Boff and the philosopher Félix Guattari's travels through Brazil in the early 1980s. Using Michel Foucault's methodology for the empirical study of ethics, I show how transversality constitutes a new and fragmentary mode of ethical subjectivation that rearticulates the role of expert knowledge in moral practice. Rather than assuming that knowledge must precede practice, transversal thinking among climate analysts sees knowledge as something that can be *used* in the interest of particular goals. This new strategy allows for concrete action even when knowledge is limited, making transversal ethics especially promising for addressing the horrors of the climate crisis.

Finally, in chapter 6, I show how this transversal mode of ethics struggles to address the challenges discussed in the preceding chapters. I trace instances of "aspirational realism," or moments where climate actors express a desire to "do something real" while worrying that past or ongoing actions have failed to accomplish anything substantial. I trace the history of Mineiro geopolitics to demonstrate how the new strategies signal a fundamental shift. In particular, I explore the emergence of new forms of territoriality and the materiality of politics through two of GEMUCs largest ongoing projects. The first project is the *conscientização* educational programs that draw on the work of Paulo Freire to "integrate" participants in an environmental "reality." The second project, Eco-System Based Disaster Risk Reduction, or ECO-DRR, uses

plants and other organisms to repair flood damage and mitigate future disasters. It exemplifies transversal action by relying on local plants to "spontaneously" address an unknown future. Both ECO-DRR and *conscientização* show how a transversal engagement with the environment promises "real" action in response to the crisis.

Chapter 1: FALLING CONSTELLATIONS
The Disorientation of Disasters in Minas Gerais

"The disaster, unexperienced. It is what escapes the very possibility of experience – it is the limit of writing. This must be repeated: the disaster de-scribes."
Maurice Blanchot, *The Writing of the Disaster*

This chapter is about the disorientation that accompanies disasters. It emerges in part from my own persistent sense of being adrift during my fieldwork as Minas Gerais was constantly bombarded by new calamities. The multitude of disasters and their associated disorientations made it difficult for me to gain a stable understanding of the present. Rather than attempting to resolve the uncertainties and presenting the situation in Minas Gerais from 2017 to 2018 as one characterized by a "new normal," this chapter invites the reader to dwell within the disorienting space of ongoing disaster without the feeling of solid grounding.

The following sections are montage of five disasters that surrounded my fieldwork. The moments are not presented chronologically or with any particular logical connections. Borrowing from the techniques of the great horror filmmaker, Alfred Hitchcock, a montage helps "to illustrate character, to convey ideas or even to create motion by the juxtaposition of static objects" (1995, 223). The montage also allows for the emergence of "something extra, a surplus or an excess [which] speaks back to the elements and produces a state of generative instability" (Suhr and Willerslev 2013, 1). The montage is not intended to present an image of Minas Gerais as "broken" and irredeemable (Tuck 2009), but rather to convey the atmospheric conditions that influence the current and future actions of analysts, activists, and artists as they move forward. The chapter will close with a consideration of the limits of philosophical and theoretical efforts to conceptualize "disaster."

Disaster Montage

/// One ///

In late 2015, a dam collapse unleashed sixty-two million cubic meters of mining waste on the municipality of Mariana, in the Brazilian State of Minas Gerais. The wave of toxic waste, belonging to the mining conglomerate Samarco, quickly entered the Rio Doce. The river overflowed its banks, devastated the nearby city of Bento Rodrigues, and ultimately drained into the Atlantic Ocean. The full extent of the damage inflicted is difficult to fully comprehend. For the people of Bento Rodrigues, the flood killed 19 people and left 600 homeless, as their town was submerged in toxic mud. For the 41 municipalities downstream, the leakage of toxic mining waste cut off access to clean drinking water (Neves et al. 2016). For the fish of the Rio Doce, the timing of the disaster during their spawning season led to potentially irreparable damage to their population (Fernandes et al. 2016).

Activists from the Indigenous Krenak people describe the damage of the dam collapse as extending beyond the material loss of Krenak lives and territory into religion and spirituality as well. As the Krenak activist Shirly Djukurna Krenak explained, "The whole process of the religion of my people, of the Krenak people, was made in the river. […] So [as a result of the flood] everything has been modified, everything has changed and we are now adjusting to a new way of living" (Neiva 2016). According to another Krenak activist, then thirteen-year-old Kathy Krenak, "[The flood] ends up killing the Krenak people" (*If Not Us Then Who?* 2018).

Since the flood devastated the fish, water, and land that the Krenak relied on for subsistence and ritual, the disaster may have been apocalyptic to them. However, it was not the first apocalypse they had experienced. As Waubgeshig Rice from the Wasauksing First Nation writes in his tale of the apocalypse told from the perspective of North American First Nations,

"Our world isn't ending. It already ended. It ended when the Zhaagnaash [white people] came into our original home down south on that bay and took it from us" (2018, 149).

Legal action against Samarco and its joint parent companies, the Australian BHP Billiton and the Mineiro Vale companies, have been slow to provide relief for the affected populations. While the companies have paid fines to the state and legal cases are still pending in appeals, life along the river has yet to recover.

In January 2019, another dam collapsed in Brumadinho, a town about 80 kilometers to the West of Mariana. This tailings dam was owned by Vale, the same company that co-owned the Bento Rodrigues dam. The stories eerily mirrored each other. The dam collapsed, unleashing a wave of toxic waste into a local river. At least 250 people died in the disaster.

I had already returned to Canada by the time this disaster occurred, but when I saw "Minas Gerais" splashed across the headlines of *The New York Times*, *The Guardian*, and other international newspapers, I was shocked. Like many visitors to Minas Gerais, I had visited Brumadinho. Alongside the historical state capital, Ouro Preto, Brumadinho attracts most of the tourism to Minas Gerais, as visitors flock to Inhotim, an enclave of contemporary art galleries and botanical gardens set into the Mineiro hills. Originally a plantation owned by an English engineer referred to as "Senhor Tim," the land was converted into a utopian oasis for artists, tropical plants, and cultural events by the mining businessman Bernardo Paz during the 1980's. Already suffering from allegations that Inhotim was a means for Paz to launder funds to his mining companies (Sandy 2018), the devastation of Brumadinho posed yet another challenge to the Minas Gerais tourism industry.

In response to the disaster, the freshly inaugurated Minister of the Environment responded quickly with a call to loosen licensing regulations for mining companies (Angelo

2019). Hopes that the state officials had learned their lessons from the Bento Rodrigues collapse quickly evaporated. As Nilo D'Avila, director of Greenpeace Brasil told the press: "This new disaster with a mining waste tailings dam – this time in Brumadinho – is the sad consequence of a lesson not learnt by the Brazilian state and mining companies" (Phillips 2019).

/// Two ///

When Luiz Inácio Lula da Silva, commonly referred to simply as "Lula," finished his term as president of Brazil, he was one of the most popular and respected politicians in the world. A leftist former union organizer who had overseen a booming economy, established and strengthened social safety systems that brought millions out of poverty, profoundly reduced deforestation in the Amazon, and improved Brazil's standing in international politics, Lula was supported by the vast majority of Brazil's population. His chosen successor, Dilma Rousseff, a former cabinet member and guerrilla fighter against the military government, handily won the 2010 and 2014 elections, resulting in their *Partido dos Trabalhadores* (PT), or Workers Party, to win an unprecedented four sequential elections. During its thirteen years in power (2003-2016) the PT reshaped much of Brazilian political and social life, resulting in more expansively democratic and left-leaning policies taking shape in numerous domains.

However, the PT's fortune began to fade in the mid-2000s. While economic programs like *Bolsa Familia*, a basic income program aimed at mothers, reduced inequality and brought 30 million Brazilians out of poverty, price reductions in commodities that buoyed the Brazilian economy began to undo these gains. By 2016, 3.6 million Brazilians were falling below the poverty line each month (Nolen 2018). Racial resentments about the improving fortunes of

black, *pardo,* and Indigenous Brazilians began to engender a popular backlash again the PT (Ansell 2018).

In the midst of growing dissatisfaction with the PT, many politicians and citizens turned their attention towards a seemingly humble corruption investigation operating under the name *Lava Jato*, or "Operation Car Wash." Starting as an investigation into money laundering at a Brasília car wash, the investigation's chief judge, future Minister of Justice Sérgio Moro, expanded the investigation until it resulted in the arrest of three presidents (Mello, Lula, and Temer), members of the Brazilian senate, the executives from the Odebrecht business conglomerate, and numerous others in Brazil and internationally. By 2017, a headline in the *Guardian* asked, "Is this the biggest corruption scandal in history?" (Watts 2017)

Concurrently, although officially unrelated, President Rousseff faced her own accusation of corruption. In April 2016, the senate officially impeached her on allegations of "*pedalada fiscal,"* or "fiscal pedaling," claiming that she had misrepresented financial records in order to conceal Brazil's weakening economy. With her impeachment, Rousseff was removed from office and replaced by her Vice President, the fiscally conservative Michel Temer. By the time Temer's term ended and by Bolsonaro was elected in 2018, Temer himself had been indicted in the *Lava Jato* investigations.

It has since come to light that Moro, Temer, and others collaborated to defeat the PT, which had previously been unassailable in public elections (Greenwald, Reed, and Demori 2019). Exposure of this scheme has been catastrophic for Brazilian confidence in the government. While perceptions of corruption in Brazil are not new, watching the previously popular Lula arrested and jailed clearly had a demoralizing effect.

Within the halls of government bureaucracy in Belo Horizonte, it was difficult to talk about these events. As an outsider, I was often suspected of being an investigator looking for corruption. Whether or not one was in fact guilty of corruption did not seem to matter. The mere accusation of corruption could end a career if taken up by a powerful political opponent. While I was therefore forced to steer away from the topic of corruption, many of my interviewees would frequently look over their shoulder or request to speak in private settings, all hoping to avoid any suspicions of corruption or of being an informer.

The *Lava Jato* investigation and Rousseff's impeachment gravely delegitimized the state government. When I would tell acquaintances in Belo Horizonte that I worked with environmental regulators at the state capital, the most frequent response I received was something like "I hope you really nail them." Bureaucrats were never popular, but the seeming profoundness of the state's corruption meant that they were perceived as worse than incompetent or unnecessary, as they had been in the past (Cavalcante and Carvalho 2017) and were now regarded as genuinely evil. While cases of corruption may have occurred within the government, including in a section of the government tasked with regulating mining dams (e.g., Maciel 2018), there were also many other workers who suddenly found themselves under suspicion and targeted for public disdain.

/// Three ///

When I first visited Belo Horizonte in 2014 for preliminary fieldwork, the city was reeling from Brazil's disappointing 7-1 loss to Germany in the semifinals of the World Cup. The match had been held at the local *Mineirão* stadium. Despite the humiliation of the loss, the World Cup had led to a massive influx of tourism and infrastructural development for Belo

Horizonte. The city launched a new fleet of buses to bring tourists from downtown north to the stadium. The airport was renovated and expanded to handle the large number of travellers. New road signs throughout the city signaled the municipal government's desire to make a good impression on a global audience. The World Cup was only the first sports mega-event planned for Brazil. For urban planners, all eyes were looking ahead to the 2016 Summer Olympics in Rio de Janeiro. While protestors in Rio de Janeiro and other cities protested the massive use of state funds to finance the event as well as the destructive infrastructure constructions for the stadiums (Phillips 2016), the relatively more conservative and removed population of Belo Horizonte seemed to look forward to the events as a chance to showcase Brazil to the world.

Amidst this optimism, the rapid outbreak of zika took on additional significance. The virus's entrance to Brazil from French Guinea took many by surprise as the virus mutated into an unprecedented variant form causing cases of microcephaly to spike to 30 times the infection rate of 2010. Many feared that Olympic tourism created the conditions for a global pandemic (*Reuters* 2016). Public health officials called to postpone or relocate the Olympics as some athletes announced that they were reconsidering their participation (Attaran 2016).

The timing of the virus and the Olympics resulted in global media often overlooking the already present toll of the disease on Brazilians. Like most disasters, the disease was widespread but not egalitarian. Zika affected women most, both in terms of its direct potential harm to pregnant women but also because of inequalities in access to healthcare, sanitation, and in terms of the labour of managing the disease and its prevention (Diniz 2016; Wurth 2017).

As the Olympics and the worst of the zika outbreak faded from the headlines, Southeastern Brazil faced another mosquito-borne epidemic, yellow fever. Yellow fever was not new to Brazil, but two events in particular caused a massive surge in the disease between 2016

and 2018. First, a series of ecological events including the Mariana dam collapse led to human populations living in closer proximity with infected mosquitos. One consequence of the Rio Doce overflowing its banks was the preponderance of calm, still water sitting in locations which had previously been dry. These ponds served as ideal breeding grounds for mosquitos and facilitated the spread of yellow fever.

The second event was a global shortage in the yellow fever vaccine. In 2015, the French pharmaceutical company Sanofi Pasteur, began to transition its yellow fever vaccine production from an old factory to a new installation. The transition was supposed to be seamless, but issues in the construction of the new production plant delayed its opening. Unfortunately, the old plant had already suspended operations, resulting in a break in production of the vaccine (Gershman et al. 2017). Through 2016 and 2017, prices of the yellow fever vaccine skyrocketed. Doctors worldwide began to give partial doses to travelers. While providing less protection, the partial doses allowed medical institutions to stretch their remaining supplies until production began again. In Brazil, the public does not generally vaccinate against yellow fever. When the epidemic began in 2017, the government called for a widespread vaccination campaign, but supplies were running low due to the global shortage (Beaubien 2018). While the Oswaldo Cruz Foundation in Rio de Janeiro scrambled to produce a vaccine of it its own, the conjunction of ecological disasters and vaccine shortages precipitated one of the largest outbreaks of yellow fever in Brazil's history (Bogaz 2018).

As a condition of my visa application, I had already been vaccinated against yellow fever before I arrived. Like many of my colleagues who had also received vaccinations, I did not witness the epidemic directly, nor did I fear for my own safety. The yellow fever outbreak emerged in my experience most evidently through its impact on parks. Inhotim, worried that its

idyllic lagoons would become infected mosquito breeding grounds, began requiring visitors to prove that they had received a vaccination before entering. Many of Belo Horizonte's largest public parks, like the picturesque *Parque Municipal das Mangabeiras* which wraps around the southern border of the city, shut down when attendants found dozens of monkeys dead from yellow fever (Alberto 2017). While only mosquitos transmit the disease, monkeys are also susceptible. Researchers in Minas Gerais could thus follow the progress of the disease through its impact on monkeys (Lopes 2017). Unfortunately, rumours spread through the city that monkeys could also spread the disease, leading some to view urban monkeys as dangerous pests (*Globo* 2017). Discretely poisoning monkeys thus appeared as a proactive way to protect the city from the epidemic. By the end of 2017, I no longer saw any monkeys, which had once been a common sight, in the downtown parks of Belo Horizonte.

/// Four ///

As an outsider in Minas Gerais, nothing about the weather stood out to me. When I arrived in Belo Horizonte in August 2017, the end of the Mineiro winter, it was pleasantly warm and dry. Highs of 23 ºC, lows of 19 ºC. The 40-minute bus ride from the airport to downtown crossed through the rolling golden hills of the *cerrado*, Brazil's rapidly vanishing savannah. The long grasses gave way to a hard scrabble of bushes in the valleys, some with traces of green if there happened to be a creek, but mostly brown and hard. Scents of eucalyptus wafted through my window, blowing in from the copses of narrow grey trees that dotted the hilltops. From time to time, a burst of vibrant purple or yellow would flash. The ipê trees were blooming that week,

their bright flowers so dense that they occluded their canopies, making them reminiscent of Doctor Seuss illustrations.

The bus crossed through a tangled web of branching highways as we approached downtown. Like the Brazilian capital of Brasília, central Belo Horizonte is a planned city, founded in 1895 to serve as the new capital of Minas Gerais (fig. 4). Contained within the circular *avenida do Contorno*, the downtown area has been mostly paved over except for a few verdant, irrigated parks and the massive trees lining the larger boulevards. Inside of the circle, the buildings were mostly constructed in two distinct phases. The first was with the initial Portuguese colonization of the area. Grand imperial cities erected in red and grey sandstone or repaired with cement stand in stark contrast with the second wave of construction which stems from the 1970s "development" efforts of the military dictatorship. Much more colorful and playful in their rounded metal designs, this second wave of construction cemented Belo Horizonte as a centre of the *tropicália* movement, an effort to create a distinctly Latin American form of modernity. Outside Contorno, these monuments give way to the informally constructed neighborhoods which emerged as the city population exceeded the originally planned limits.[6] Cinder blocks and red clay bricks climb up the hills, moving out of

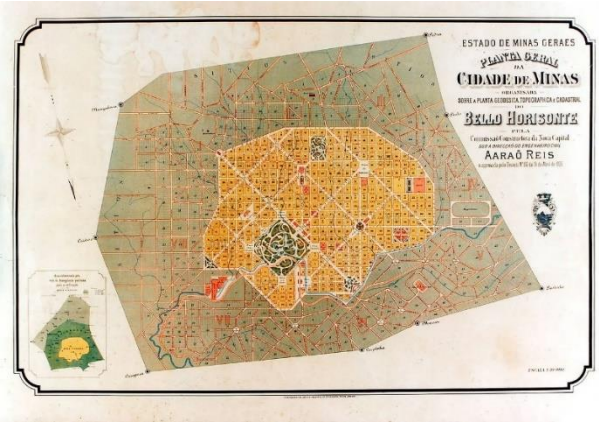

Figure 4: Original 1895 Belo Horizonte construction plan.provided by the *Comissão Construtora de Belo Horizonte*.

[6] These geographic distinctions often work to code racial and class categories into city planning. For detailed explorations of the urbanization processes in Brazil that create this distinction between formally planned city centers and informally constructed peripheries, sometimes referred to as *favelas*, see Holston 1989; 2008; and Caldeira 2000.

the flat valley which had been selected for the city centre. The trails leading up out of the city become steep, the turns winding or sharp, and the homes more precariously balanced.

Figure 5: Rain over Belo Horizonte (Assunção 2016)

To allow for a neat pattern of two grids overlapping at forty-five-degree angles throughout the city center, the rivers that historically flowed through the valley were paved over early on in its construction. The pavement and desiccated soil mean that the rain in Belo Horizonte cannot permeate the ground, leading to large flows of run-off. This was mostly how I experienced rain over the year. Occasional bursts of thunderstorms raged for hours, with sheets of water bouncing off the towering apartment buildings. Particularly intense "microbursts" felt like the sky had simply opened up (fig. 5). From a distance, I couldn't help but be reminded of images of bombs. On days like those, massive, sudden floods ripped cars and signs from the road, especially in the city peripheries as the water raced downhill. Once the rain subsided, the hot pavement and cobblestones would quickly evaporate the water and the consistent breeze would hurry out the humidity. Within hours, the streets would be dry, scrubbed clean of the dust that would settle back in by the end of the week.

It thus surprised me when, months into my fieldwork, a man stood up at a public presentation by the State Water Institute and exclaimed, "Why aren't you talking about the crisis? We're in a drought. This is a drought crisis!" I had heard small talk about the drought before, but never with his urgency. Researching it further, I found that this audience member was

absolutely correct: much of southeastern Brazil, including Minas Gerais, São Paulo and Rio de Janeiro, experienced an historic drought from 2014 to 2017. Headlines from São Paulo announced it as "the worst drought of the last 100 years" (Borges 2017). In Minas Gerais in particular, the drought conditions led to reduced farm yields in the northern sections of the state. Some scientists told me, without official data, that these challenges had increased homelessness in Belo Horizonte, as people from the rural areas moved towards the city after losing their agricultural jobs.

Initially I was embarrassed that I had missed such a calamitous event going on all around me. While traditional ethnographic fieldwork takes place over at least one year in order to observe the annual cycle of the seasons, it is easy, even during year-long research, to miss climactic trends that take place over the course of years or decades. The drought was a disaster both too rapid for the state to effectively respond to and too slow for a foreigner like myself to immediately notice. Climate change is "not only speeding up, but qualitatively changing *all the time*," as the Brazilian theorists Déborah Danowski and Eduardo Viveiros de Castro (2016, 8, emphasis original) write. Things are not only faster, but also slower. These temporal tricks mean that events like droughts might slip past public scrutiny only to erupt as "crises," as it did at the presentation.

Later, I spoke with Alejandro, a SEMAD scientist, about his work advising the government on climate concerns. Alejandro understood his work as facilitating the production of raw "data" and turning it into pieces of "information" which could inform action.[7] When I asked for a specific example of how he translates environmental data into a politically relevant piece of information, Alejandro showed me a spreadsheet of numbers. Each cell contained a rainfall

[7] Likewise, Cal Biruk (2018) shows in their work with Malawian demographers how the production of primary or "raw" data demands a wide range of careful strategies.

measurement from a particular meteorological station at a particular date. Quantitatively, this was a fairly comprehensible type of data as each number corresponded to the millimeters of water gathered in rain gauges. However, faced with the dizzying number of data points, I had no idea what to make of the spreadsheet. Analyzing this data and comparing averages with past precipitation levels produced something much more tangible: a pattern manifested through the screen. "This is a drought," Alejandro explained.

On September 2nd, 2018, only a few months after I had returned to Montréal, the *Museu Nacional do Rio de Janeiro* caught fire overnight. Due to the drought and budget cuts, the water lines leading into sprinklers in the building were dry. The museum and most of its contents burned to the ground by the morning.

/// Five ///

On a small magazine stand outside an architecture school near my apartment downtown, plastered with clippings from art journals and announcements, three brightly colored posters stood out (fig. 6). They announced in bold, blocky, capitalized letters, "[The] INDIGENOUS ARE DRESSED, NOT COSTUMED," "[The] INDIGENOUS HAVE WHATSAPP," and most bluntly, "[The] INDIGENOUS EXIST IN THE 21st CENTURY." The three pronouncements testified to the continued existence of Indigenous communities in Belo Horizonte as "modernized" citizens who looked and communicated like other urban residents.

Figure 6: Magazine stand in Belo Horizonte.

I frequently asked environmental administrators about their relationships with Indigenous groups, with little response. While discussing government collaborations with labour unions, community organizations and women's groups, I asked a municipal administrator if their collaborations ever reached out to Indigenous peoples. The administrator, who just seconds ago had been expressing her support for open participation with all sectors of the city's population in order to create progressive environmental plans, seemed surprised by my question. "Here?" "Yes, here," I reassured her. "We don't have Indigenous people in Belo Horizonte. It's completely urban, so we don't have them." Evidently, reminders of urban indigeneity were necessary.

For much of Brazil's history, the "progress" of urbanization has meant the elimination of Indigenous peoples, either by means of extermination or forceful cultural integration. As is common with European colonization, Indigenous people in Brazil are relegated to the past as something to be overcome in the name of development or advancement (Trouillot 1991). Even after the putative end of Portuguese rule, the eradication of Brazil's Indigenous peoples has continued and even intensified. During the first half of the twentieth century, pressure for resource extraction from Brazil destroyed more than eighty Indigenous groups and killed 80% of the Indigenous population (Davis 1977, 5). Many of those that survived, particularly women, were forced to join white families. It was assumed that this process would "purify" the racial demographics of Brazil (Schwarcz 2006; Biehl 2008). People would frequently tell me that their grandmother or great-grandmother (it was always a female ancestor) was Indigenous, a remaining trace of genocidal sexual violence (Deer 2009, 150).

This violence at the core of Brazilian state-formation lingers. During the year of my stay in Belo Horizonte, Brazil remained one of the deadliest countries for environmentalists, with 46

murders in 2017 alone (Watts 2018). At the same time, violence against Indigenous people steadily intensified. In 2017, the number of rapes grew by 8% while femicides grew by 6.1% (Phillips 2018a). Fears about public safety drove many to support loosening restrictions on gun ownership, one of the most common defenses I personally heard for supporting Jair Bolsonaro's presidential campaign.

This violence was a common topic of conversation. Many of my female and queer friends, who I would meet at bars closed-off to the street or perched on second-floor balconies, would attribute the violence to Brazil's *machismo* culture, where men proved themselves through aggressive dominance. Conversely, when I asked two soft-spoken male environmental analysts about the violence while sharing beers from a *boteca*, I received a different response. "There's no trust in the government," they explained to me, "If there is a conflict, everyone thinks they have to settle it themselves."

Gendered, racialized violence, disdain for the state, and *macho* responses to confrontations swirled together on March 14, 2018, when a trained gunman armed with military-issue ammunition shot and killed Marielle Franco, a progressive, bisexual, black city councillor from Rio de Janeiro on her way out from a community event (Ramalho 2018; Perry 2019). The assassination occurred during the "military intervention" in the city, with the national military taking over urban security from the local police. Promoted as a means to reduce violence, the military intervention actually corresponded with a spike in violence, particularly killings committed by law-enforcement (Child and Simoes 2019). Reading the news reports from my desk at SEMAD the next day, I noted the quietness of the office. While over 400 kilometers away, the impact of Franco's assassination delivered a chilling message to the mostly young,

mostly female climate analysts. Violence by and against the state, especially its more progressive factions, continues to haunt environmentalism in Brazil.

Disasters Versus Understanding

What is a disaster? Etymologically, the word "*desastre*," or "disaster," derives from the Italian "*dis*," implying ill or being out of place, and "*astro*," or "star." The word evokes a singular and momentous event that shatters grounding frames of reference, whether planetary or secular— encompassing anything from a meteor to an "act of God." An exemplary disaster breaks the status quo in a spectacular fashion. But what if not all disasters are so singular? Must a disaster occur all at once, at a singular time and place, or can it be dispersed, scattered, and fractured, becoming apparent in numerous guises in numerous settings in different instances? Must a disaster always exist in the foreground as opposed to the background? Can a context itself be disastrous?

When I first arrived in Minas Gerais, it was all so overwhelming. I arrived in Belo Horizonte, the capital of the southeastern Brazilian state Minas Gerais, in the middle of 2017, hoping to observe the process of biofuel regulation with the State Ministry of the Environment and Sustainable Development (SEMAD). Yet discussions kept veering away from the speculative work of building new biotechnological capacities and thrust back into a mundane world that seemed to be falling apart.

In the pages of my notebook, the disasters kept piling up. I struggled to make sense of it all. My first impulse was to filter the information. I took notes on what was going on around Belo Horizonte and in the news from around the country, but I did not expect that information to be vital for my research. I told myself that I was writing these things down in case they became

relevant *later*, but assumed that many of these notes would turn out to be little more than "red herrings." Still, I was guided by the suggestion that much of anthropological fieldwork generates an "excess" of material whose "continual juxtaposition and repetition" yields its most exciting lessons (Cohen 2000, xvi).

As I went back to reviewing my notes, I began to suspect that what had initially appeared as discrete occurrences were in fact linked. Not that they formed some sort of causal chain where one disaster led to another, nor even that the interaction between the disasters created some sort of totality. These disasters each affected different populations to different degrees. As such, at no point did any one person articulate a systematic connection between these events. However, I began to suspect that many of the ephemeral "atmospheric attunements" (Stewart 2011) I witnessed in Minas Gerais may be a consequence of this constellation of disasters.[8]

Could it be that these disasters were not separable and independent, but were rather components of a singular, monstrous event? Borrowing from Susan Lepselter, these events began to "resonate" for me (2016, 4). Uncannily, something seemed to stitch these events together without rendering any of them reducible to the others. As Amitav Ghosh has argued, the encroachment of global climate change challenges writers of all kinds to be attentive to massive, interconnected, disruptive and frequently weird events that will increasingly propagate. This kind of weirdness may resist straightforward sensemaking and instead linger as "uncanniness" (Ghosh 2016, 32). As demonstrated by the montage, the strangeness of climate disasters resonates with other disasters that may initially appear disconnected.

[8] The image of a "constellation" has been used by Theodor Adorno (1981)and scholars inspired by him (Jay 1984; Bernstein 1992) to motivate a style of analysis that allows for juxtaposition without the emergence of a unity that "would be superior, or at least more general" than any of the particular moments (Adorno 1981, 105).

Disasters strain the understanding. In the European philosophical tradition frequently referred to as "continental philosophy," there is not much room for the abrupt surrealism of disasters. Many of the most prominent philosophers argued, or took on faith, that all experiences are understandable. Through the Enlightenment, philosophers shifted from seeing the unknown as a sign of wonder and divine mystery to a more pejorative view poor understanding indicates ignorance (Daston and Park 2001, 362). For Kant, who expressed a high degree of skepticism over severing the thinking subject from the empirical world, there can be no possible experience which does not pass through the categories of understanding (1965, 131). For Heidegger, understanding is part of the existential structure of Dasein, a basic constitutive feature of any human existence (1962, 182). Even Merleau-Ponty, frequently noted as the phenomenologist most concerned with the dissociating experiences of embodied life, argued in the preface to *The Phenomenology of Perception* that "because we are in the world, we are condemned to sense" (2013, lxxxiii-lxxxiv). All experience, no matter how disordered, unprecedented, wonderful or horrific, must somehow make sense.

However, my experience of the continuous disasters in Minas Gerais seemed to escape the understanding promised by continental philosophy. In presenting the Mineiro disasters as a montage, I attempted to more accurately represent the experience of encountering them as disconnected but not fully separable events. The montage is meant to temporarily suspend efforts to make sense of the disasters of climate change and rising authoritarianism as a whole and instead present them as they are concretely experienced by people in Minas Gerais. I am not arguing that these events are senseless or that any effort to understand them is doomed. Rather, I want to remain open to the possibilities of treating disasters as incomprehensible. This treatment

of disasters is especially useful when approaching the work of climate advisors as they engage with the challenges of the climate crisis.

A common way to understand disasters is as subordinate effects of a singular cause. We could seek to understand all the Mineiro disasters as examples of a deeper disaster like capitalism, colonialism, or something equally broad.[9] However, in the midst of chaotic and complex systems, observers may find the attempt to create a clear causal chain (where A leads to B leads to C and so on) difficult or impossible to accomplish. Adriana Petryna (2018, 571) notes that the chaos of climate change makes even the concept of projection "untenable." The uncertainties and complexity of these kinds of massive events makes specific predictions practically impossible. Instead of trying to determine the monolithic "root" cause of disasters, we might instead trace out the multiple, differentiated and looping networks as they meander from event to event. By following the winding tendrils of various disasters, we might find unexpected connections, resonances, feedback loops, or other interactions between seemingly disparate phenomena. Because of the limitations of tracing disasters back to a monolithic cause, revaluating causation is vital for anthropologists interested in the climate crisis.

In recent years, many theorists have struggled to provide terminology to describe the distributed, polymorphous webs of negativity which pervade contemporary life. Elizabeth Povinelli coined the term "quasi-event" to call attention to the exhaustion and troubling of everyday life: "If events are things that we can say happened such that they have a certain objective being, then quasi-events never quite achieve the status of having occurred or taken

[9] The philosopher Graham Harman refers to the strategy of explaining an object of inquiry through reference to an underlying cause or form as "undermining," inquiry which treats objects as "mere surface effects of some deeper force" (2011, 6). Avoiding undermining does not require dismissing all causation, but rather it cautions inquiry to note that turning attention towards cause deflects attention from the initial object. In the case of the disasters discussed here, my point is not to say that these events do not have causes, but rather that dwelling on the causes distracts from the experience itself.

place" (2011, 13). Enduring events like droughts and economic depressions would seem to conform to this model. Quasi-events easily evade notice because of their low-level, long-term intensity, something like a white-noise buzz in the background. Povinelli contrasts "quasi-events" with "catastrophes," the archetypical events which demand attention in sudden, surprising moments. Events like a flood wiping away a river ecosystem within a matter of hours lean more towards the catastrophic register than that of quasi-events.

Are quasi-events and catastrophes so easily distinguished? Conceptually separating the two types of events obscures the commonalities and mutually amplifying effects of disasters that could otherwise appear unrelated. For example, when the Samarco dam collapsed, previously dry land was waterlogged, making abundant new breeding grounds for infected mosquitos. While difficult to assess in the ruined aftermath of the collapse, some environmental analysts speculated that the drought had reduced the strength of plant roots which anchored the mining tailings dam in place, making the containment wall more brittle and vulnerable. Where are the borders between the quasi-event drought, the catastrophic dam collapse, and the again quasi-event Zika outbreak? For all their obvious differences, sinister linkages run amok amidst the scenes of disasters. "Quasi-events" and "catastrophes" resonate with each other. Their mutual amplifications render the distinction between the two untenable in the climate crisis.

Timothy Morton offers the terminology of "hyperobjects" that may better explain the resonance of multiple disasters. "Hyperobjects" are "things that are massively distributed in time and space relative to humans" (Morton 2013, 1), objects whose temporal and spatial scales entirely exceed the frames of most philosophies of objects. Considering climate change as a singular (hyper)object means that every instance of its appearance, from heat waves in North America to the Brazilian drought, would be different facets or parts of a unified entity. Morton

illustrates hyperobjects with the scenario supplied by Edwin Abbot's *Flatland* novella (Abbott 1992; Morton 2013, 49). Imagine an entity whose life and perspective exists only in two dimensions. If a three-dimensional sphere were to pass through its plane of existence, the flatlander would only perceive a circle, a two-dimensional slice of that object, which would grow from nothing and then shrink away as it passes through. If one were to imagine placing their fingertips on the flatland plane, the flatlander would see five shapes. Reasonably, a flatlander may speculate that they are witnessing five separate objects, but in fact they are only seeing one object which is unified on a third spatial plane that the flatlander cannot perceive. Comparably, a hyperobject is a singular entity which may appear disconnected to us but may be linked in a separate, inaccessible dimension.

Morton's hyperobjective perspective provides a useful heuristic for considering the complex entanglements of disparate events into a singular whole. However, Morton proposed the idea of hyperobjects to respond to a philosophical challenge to the status of objects in philosophy, not to explain people's concrete experiences. People do not experience the climate crisis and authoritarianism as singular entities or part of a singular entity. It is not clear that informing these publics of the transcendental unity of these disasters provides a useful tool for responding to these events. As I will explore further in the following chapter, efforts to conceptualize climate science in an expansive, holistic manner where everything is connected to everything risks overwhelming scientific and governmental capacities.

Chapter 2: BOUNDARY EXPERTISE
Reflexivity at the Confluence of Environmentalism, Complex Systems, and Authoritarianism

"'What does the border look like?' A child's question. A question whose answer means nothing. There is nothing but border. There is no border."
Jeff VanderMeer, *Acceptance*

As Minas Gerais endured a multitude of disasters, the team of climate scientists within the state government strained to provide suitable scientific advice. The challenges the scientists faced multiplied. Not only did they need to discuss the "natural" scientific questions of meteorology, ecology, and climatology, but they had to do so while simultaneously dealing with the "political" constraints of budget cuts, corruption, and non-compliance with existing environmental protections. Describing this complex situation, many analysts used the word *"fronteira*" or "border" to describe the experience of having one foot in a scientific domain and another foot in a government institution. "Boundaries" offered a key concept for analysts to reflect on their own work.

In this chapter, I engage with the concept of "boundaries" and other moments of self-reflexivity to gain a better understanding of climate analysts' work and their understandings of the environment. What do "science" and "politics" mean to people facing the complexities of the climate crisis? What does it mean for science and politics to meet at a moment where both the physical environment and democratic institutions are deteriorating? As I will show, the tensions implicit in "boundary work" give way to an alternative form of self-understanding that diminishes the distinction between science and politics.

Methodologically, this chapter engages with ethnographic observations and works published by Mineiro climate analysts. The combination of these sources complicates traditional anthropological modes of analysis. Typically, the experiences of the observed population are

explained by theory derived from academics with little or no connection to the field site. The sociologist of science Niklas Luhmann typifies this process by distinguishing "first-order observations," or direct observations of the world, from "second-order observations," which are observations of those first-order observations (Luhmann 1998, 47–48; Langlitz 2007). Second-order observations are observations of observations. Classical formulations of ethnography such as the distinction between internal "emic" and external "etic" categories (Harris 1976) map onto this distinction between first and second-order observations.

However, as climate scientists both observe the world and evaluate their own place within the political-economic systems which produce and address climatic degradation, they are forced to be self-reflexive about their first-order observations (Beck 1992, 87). Brazilian state climate scientists are keenly aware that they are part of political institutions (Lahsen 2002). While some critics might suspect that this compromises the legitimacy of their scientific findings, Marko Monteiro and Raoni Rajão (2017) documented that Brazilian climate scientists dedicate enormous effort to reducing potential ambiguity and misunderstanding so as to work more effectively within partisan politics. Due to the necessity of considering the potential interpretations of their work, second-order observations, both of themselves and their communities, are an integral part of climate scientist's daily lives.

The distinction between first and second-order observation begins to collapse in contemporary climate science. Instead, climate analysts are observing a world that always includes themselves as well as others observing them, such as climate scientists, governmental supervisors, or foreign anthropologists. Many climate scientists turn to publications in Science and Technology Studies (STS) to better understand their situation. Therefore, I was not "introducing" authors like Bruno Latour or Donna Haraway to climate analysts in Minas Gerais,

they were already conversant in debates about the social and political circumstances of scientific work. By engaging with the climate scientists' own readings of STS, I am taking seriously the terms that they themselves use to understand their work, rather than imposing my own imported concepts and theoretical frameworks on to their experiences.

The Concept of Boundaries

The concept of "boundaries" is a prime example of Mineiro climate scientists understanding their work through a concept from STS. In "Boundary work in climate policy making in Brazil: Reflections from the frontlines of the science-policy interface," a scholarly article by state climate analysts and professors at the *Universidade Federal do Minas Gerais* (UFMG) explicitly refers to the labour of government scientists as "boundary work" (Nunes, Rajão, and Soares-Filho 2016). Their usage of the term "boundary" originates with Susan Star and James Griesemer's study of the Berkeley Museum of Vertebrate Zoology (1989). As a museum that relied on specimens from amateur collectors, the curators found themselves needing to facilitate interactions between diverse communities. Amateur naturalists provided specimens, academics provided information, and public audiences brought their own interpretations to the displays. Star and Griesemer coined the term "boundary objects" to designate "those scientific objects which both inhabit several intersecting social worlds and satisfy the informational requirements of each of them" (1989, 493). For example, a taxidermic preservation of an animal might mean very different things to the collector that found it, the curators that selected it for the exhibit, and the public that views it. However, in all these cases, it remains the same object that traverses the boundaries between communities and provides an anchor point for conversations between these various groups. As Star and Griesemer explain,

"Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites" (1989, 493).

When the climate scientists used the term "boundary objects" in their publications, they acknowledged that there can be multiple interpretations of the objects they are studying, but that there is still a real object that is being interpreted. This situates their work as firmly "realist" as opposed to a more "constructivist" approach (for example, see Mol 2003). Studies and reports on greenhouse gases, floods, and regulations may mean different things to different communities, but the discussions must pertain to something externally real. While not opposed to debate and understanding that inquiry may not be easily settled, most of the climate analysts never doubted that global climate change was a real event that needed to be addressed, and that denying this fact was unacceptable.

In their article, the UFMG academics and climate analysts describe GEMUC's umbrella organization, the *Fundação estadual do meio ambiente* [FEAM], as a "boundary organization" straddling the line between policy and science (Nunes, Rajão, and Soares-Filho 2016, 86). David Guston coined the term "boundary organization" as an extension of the concept of "boundary objects" (1999). "Boundary organizations" are institutions that work with boundary objects at the science-policy interface. Boundary organizations translate the various meanings of boundary objects across different communities to foster collaboration. Nunes, Rajão, and Soares-Filho (2016) describe translation as the primary function of FEAM, whether it is translating scientific expertise into political action, translating political objectives into research priorities, or translating this hybrid work as a whole into something palatable to industrial or popular audiences. As it has been defined within STS by Michel Callon and Bruno Latour, translation is

"all the negotiations, intrigues, calculations, acts of persuasion and violence thanks to which an actor or force takes, or causes to be conferred to itself, authority to speak or act on behalf of another actor or force" (2014, 279). In the case of Mineiro climate analysts, translation operates by constantly tacking back and forth across the science-politics boundary.[10]

Bounded Limits

Reflexive commentaries about the uncomfortable boundary between "science" and "politics" were commonplace in GEMUC. One morning, I returned to my desk to find a quiet conflict taking place at a neighboring workspace. "*Infelizmente, nós trabalhamos na política,"* Lucas sighed, exasperated. "Unfortunately, we work in politics." Marcia stood over him, much more animated as she explained her vision for her presentation about atmospheric science for another branch of the state government. In addition to quickly summarizing the basic science of climate change, like the greenhouse gas effect and the water cycle, her presentation laid the blame for environmental destruction squarely at the feet of the powerful mining industry.

Lucas seemed tired, as if he had been forced to resign himself to the brute political restrictions on their work. He expressed his desire for a more tactful presentation that avoided bold proclamations. Lucas spoke with Marcia while seated at his desk, as he did for most meetings, his eyes focused on the PowerPoint presentation she had prepared on his screen. Like

[10] The concept of boundaries was my entry point into GEMUC. A climate scientist agreed to facilitate my access to the Mineiro government offices, but I still needed to introduce myself to the rest of the team and gain their support. In exchange for working with GEMUC I conducted an evaluation of their past international collaborations, paying special attention to the emergence of boundaries between GEMUC and their various collaborators. With the help of Dr. Raoni Rajão, one of the UFMG professors who coauthored the "boundary organization" article, I presented my work as a kind of boundary work. In particular, I explained that my training as an anthropologist would allow me to better observe the "cultural" differences that troubled or eased their collaborations. Since some members of GEMUC had already used the vocabulary of "boundaries" to describe their own work, the terminology allowed me to introduce my work in commensurable terms. By offering us a shared terminology, the concept of "boundaries" became a boundary object itself.

many of the analysts in GEMUC, Marcia was a woman from a middle-class family and was much younger than most state employees, having been recruited into the government shortly after finishing her graduate studies at one of the top state universities. She and many of her colleagues contrasted with the senior administrators of the government, who were likelier to be men with lighter skin[11] and well-connected families.[12]

Open disputes were rare in the workplace. For the most part, an air of collegiality prevailed, even if disagreements might have bubbled beneath the surface of "concept notes," official documents the analysts wrote to propose priorities and methods for addressing climate change. The dispute between Lucas and Marcia was a rare outlier. Lucas advised Marcia to keep her presentation simple and focused on the basic science. The goal, in his logic, was to inform the government about how to adapt to climate change and mitigate disasters from it. As he explained to me in an interview, even if he may have privately wished for a more active role, this modest advisory work was the official purpose of FEAM. Marcia, on the other hand, wanted to contribute more directly and aggressively. For her, the basic climate science was nothing new and there was good reason to believe that many administrators had heard it before. She herself had already presented the basics countless times, likely to some of the same people she would speak to later that day. Rather than explain the greenhouse gas effect yet again, Marcia wanted to discuss the political inaction and industrial activities that contribute to climate change. While not

[11] The construction of race operates noticeably differently in the Iberian traditions of Brazil compared to predominate North American constructions (Daniel 2007; Anderson, Roque, and Santos 2019). Many of my Brazilian friends and acquaintances shared the experience of being considered "White [*branco*]" in Brazil but racialized as "Latino" or "Hispanic" when traveling abroad. Due to the particularities of racial construction in Brazil, I did not feel comfortable assuming anyone's race unless specifically told by that person. However, numerous studies have shown that experiences of racialization in Brazil correlate strongly with skin tone and descent (Schwarcz and Starling 2018).

[12] Government efforts launched in the 2000s to reduce racial and economic inequality in education and employment had noticeably diversified the state's workforce, which added new layers of tension to disputes between young climate scientists and their older administrators.

disagreeing with the substance of Marcia's critical assessments, Lucas counselled caution and restraint: "Unfortunately, we work in politics."

Moments like this confrontation revealed deep tensions experienced by government scientists in Minas Gerais. In interviews, the analysts anxiously expressed that it felt like the knowledge acquired through scientific studies could not amicably coexist with the responsibilities and strategies of institutional politics. Presentations had to simultaneously testify to the horrors of the global climate crisis while also conforming to the strategic and circumspect aesthetics of bureaucratic institutions. The resulting impasse contributed to an atmosphere of dread experienced within the halls of the state bureaucracy. There was an implicit question left unvoiced: why did the state employ scientists if it had little interest in listening to them?

The Emergence of a Boundary Organization

When I first arrived at GEMUC, I was asked to give a brief presentation of my research. As previously mentioned, I was coached to present anthropology as a form of boundary mediation. Immediately after the presentation, Lucas gave me two books*: A questão ambiental em Minas Gerais: discurso e política* [*The Environmental Question in Minas Gerais: Discourse and Policy*] (Starling and Murari 1998) and *FEAM 20 anos: história e memória* [*FEAM at 20 Years: History and Memory*] (Pereira and Faria 2010). Both books were published by FEAM and documented the history of environmental regulation in Minas Gerais. The books were part of the effort towards self-reflexivity in the environmental bureaucracy and served to both publicize their work as well as help them better understand themselves. These books are another way of dealing with the issue of reflexivity. In the books, the analysts turned more to history than STS to provide an avenue of self-reflection. Using these books and their bibliographies as guides, I was

able to track how the institution of state climate analysts emerged. The history demonstrates that Brazil's democratization is deeply implicated in boundary work.

Scientific expertise and democratic egalitarianism have historically experienced a fraught relationship in both Brazil and worldwide. After the end of the second World War, European efforts to rebuild drew heavily upon a wide range of expert communities. Economic planners from both the United States of America and the Soviet Union saw repairing the devastation of Europe as an opportunity to create the ideal conditions for either capitalism or socialism, respectively (Turner 2011, 119–20). Both sides of the Cold War viewed economic experts as an opportunity to bring "reason" to the messiness of global politics. Paradoxically, efforts to "rationally" design economies, governments, and societies were built on an ideal of expertise as something free of political considerations. Despite wide-ranging political and social changes brought about through development projects worldwide, the "technocratic" experts and institutions envisioned themselves as primarily politically neutral (Ferguson 1994). One of the effects of the de-politicization of development was a gap between technical experts and the public. Issues could be "rendered technical" and sequestered from public discourse for deliberation by specialized experts only (Li 2007, 7; Harvey and Knox 2015, 160). In this way, the post-war discourse of development set democratic politics against scientific expertise.

In Brazil, the military government took a similar approach to economic development, favouring a technocratic approach that separated expert-guided state actions from civil society, ostensibly populated by laypeople (Guimarães 1991, 113). Minas Gerais founded its first environmental agency, the *Diretoria de Tecnologia e Meio Ambiente* (DTMA), in 1975 as a technocratic means to support industrial development. Historically and presently, Minas Gerais has had a large mining industry. The DTMA was created as a technical support to reduce

pollution from mining and to support the development of cleaner industrial practices. In contrast to later environmentalist desires for conservation, the DTMA worked closely with industry. According to the *Diretrizes Basicas do II Plano de Governo de Minas Gerais,* a 1976 government publication clarifying its role, the DTMA was part of a project of "rationalizing" resource use, promoting a "scientific" model of development for the state while also working to "internalize the environment at all levels of decision making" (Starling and Murari 1998, 60). One of the results of this "rationalized" and "internalized" environmentalism was the exclusion of the public and marginalized peoples in particular.

Early state environmental analysts in Brazil sought to address the tension created by the technocratic imposition of a boundary between civil society and scientific institutions. As the global environmentalist movement was taking shape in the 1970s, Brazilian environmental activists resorted to two strategies to secure resources and political capital. First, many Brazilian environmentalists framed their work as cosmopolitan or international. As the Brazilian regime was seeking to improve its standing in global politics, the first United Nations Conference on the Human Environment in Stockholm in 1972 pressured the country to form a national environmental regulatory apparatus. The international pressure prompted an increase in federal support for environmentalism, leading many writers to describe environmentalism as a fundamentally "foreign" interest (Starling and Murari 1998, 35). In other words, it behooved Brazilian environmentalists of this period to deemphasize their personal motives for engaging with the environment while overemphasizing the cosmopolitanism of their activities. Many of the environmental analysts I spoke to who were active in the 80s or earlier explained to me that some of their first work was to secure support, even if in name only, from international organizations to legitimize their labour in Brazil. While this account neglects the longer history

of environmentalism in Brazil which predates the 1970s (Pádua 2002), it framed environmentalists as part of the broader project of modernization in a European model.

Second, environmentalists framed themselves as scientifically and technologically advanced. Paulo Nogueira Neto, the first national Secretary of the Environment, describes his early days in the newly created office as a scrappy struggle for time and resources. As part of his "environmental guerilla activities," Nogueira Neto found that emphasizing his credentials as a biologist afforded him more opportunities (Hochstetler and Keck 2007, 24–28). Like many other environmentalists during this period, he found that the military government interested in economic development and resource extraction was more willing to listen to a scientific expert than to popular activism. Brazil's representative at the Stockholm conference later wrote that environmental politics at this moment seemed like "a limited debate, given its scientific and technical characteristics" (Lago 2007, 17). Like the appeal to internationalism, the appeal to scientific authority severed environmentalism's link with popular activism.

Starting in the 1970s, "anti-political" experts engendered a backlash worldwide. Widespread awareness of the political stakes of technocratic development created a number of "anti-expert" social movements, such as the De-institutionalization movement and feminist critiques of androcentric medicine (Murphy 2012). In Brazil, the backlash coincided with a growing push for democracy in the 1980s. There, the anti-expert movement joined with an explicitly Marxist understanding of science, especially within the *Partido dos Trabalhadores* (PT), the left-leaning political party which governed Brazil from 2002 to 2016 (Lahsen 2011, 170). In the Marxist account, science emerges out of particular social and economic positions that determine its priorities. As Marx argues in *The German Ideology*, "The ideas of the ruling class are in every epoch the ruling ideas" (172). By linking intellectual production and political-

economic hierarchies, the PT was able to effectively criticize the presumed neutrality of the dictatorship's technocratic initiatives.

The PT's critique of the dictatorship's use of science set the grounds for the emergence of environmentalism in a democratized Brazil. Brazil's democratization in 1985 has frequently been heralded as a moment of enormous civic participation in environmentalist politics. The institutional restructurings that occurred throughout democratization created or revolutionized a number of the contemporary federal and state environmental agencies. However, qualitative studies of democratic participation in environmental politics post-1985 have not demonstrated significant shifts in the number of people involved in environmental decision-making (Midlarsky 1998). The impact of democratization was not an immediate influx of activists from civil society into the state bureaucracies.

Nonetheless, by loosening authoritarian restrictions on activism, democratization changed the terms of environmentalism in Brazil. Political exiles returned from abroad with European ideas of Green Party politics (Hochstetler and Keck 2007, 12). However, distinct from environmentalism in the global North, Brazilian environmentalism in this period congregated around a formulation of "*socioambientialismo*," or "socioenvironmentalism" (Santilli 2005). *Socioambientialismo* was jointly concerned with socioeconomic inequality and environmental degradation, considering both to be inextricable parts of the process of (post)colonial exploitation. These activists argued that creating a new and sustainable future for the country would require a simultaneous concern for the poor and for ecosystems. *Socioambientialismo* created a coalition of diverse social movements, ranging from labour activists to Indigenous groups and environmental scientists. Through this hybridity, it infused a vision of social justice and democratic politics into Brazilian environmentalism (Hochstetler and Keck 2007, 98).

The Uneasily Alliance of Science and Democracy

Brazil's history of environmental abundance, exploitation, and democratization provides a particularly intense focal point to help investigate the relationship between scientific authority and democracy.[13] Mineiro climate scientists used what they learned from international climate negotiations to inform their work. Many turned to the work of Bruno Latour (1993; 1999) to articulate the "hybridity" of simultaneously engaging with science and politics. Latour proposed that modernity imposes a strict division between the categories of nature and culture. Everything is either a part of human affairs, and thereby subject to culture, interpretation, and free will, or it is part of nature, and thereby bound by the immutable laws of physics and causation. In ideal terms, everything fits into only one of these two binary terms. Messy "hybrids," entities that

[13] The tension between scientific expertise and democratic egalitarianism as it relates to climate change remains in both Brazil and abroad. Many discussions of climate change lament the "gap" between climate science and climate action (Callison 2014; Fleischmann 2018). The concept of a "gap" frames the problem as one where the general public simply lacks the necessary knowledge to prevent the climate crisis. Strategies to address this include popular science commentators like Bill Nye making frequent appearances in mass media to better educate a skeptical public on the basics of climate science. From this perspective, the problem of political inaction on climate change only requires scientific authority to win over public opinion. Or perhaps, more pessimistically, that public opinion (and democracy) might not be adequate to address climate change. Fears of "eco-fascism," where environmentalism leads to authoritarianism, loom on the horizon (Lin and Shirley 2009).

On the other hand, critics of technocratic anti-politics may wish for scientific authority to be wholly subsumed under democratic processes, especially when technological development seems to endanger public well-being. As Paul Feyerabend argued against the backdrop of anti-nuclear movements and nascent global environmentalism: "In a democracy 'reason' has just as much right to be heard and to be expressed as 'unreason' especially in view of the fact that one man's 'reason' is the other man's insanity" (1993, 161). More recent and measured arguments for "citizen science" have likewise pushed for greater societal control over scientific work (Jasanoff 2007). When public safety is at stake, it can be easy to argue for citizen oversight on technological research and development. However, when a population seems to deny the severity or existence of global climate change, it becomes easier to understand expert hesitation about handing control over to elected officials. Delegating climate governance over to the popular will risks diminishing the urgency of the crisis if the population rejects or ignores scientific expertise.

seem to mix nature and culture, like climate change, are therefore difficult to discuss within the frame of this modernist "purity."

In Brazil, Latour's arguments were preceded by a strong critique of positivism in the early twentieth century. Writers and politicians like Sergio Buarque de Holanda (1936) and Mario de Andrade (1928) critiqued the dictatorship's desire for Brazil to approximate Europe and the United States by simultaneously adopting "higher" technology and violently removing non-white populations. Instead, Buarque de Holanda and de Andrade argued that Brazil remained an ethnic "hybrid" nation, and that celebrating this multi-ethnic legacy was the key to Brazil's own form of modernization (Rajão and Duque 2014). Buarque de Holanda and de Andrade's project of Brazilian Modernism embraced boundary crossing as an ideal. In this way, their critique of racial purity extended into a broader critique of the isolation of "nature" from "culture." As a result, scholars inspired by their project were skeptical of scientific positivism and launched a Brazilian tradition of challenging the division between naturalistic science and human affairs like politics or culture (Flusser 2011b; Sued 2018).

The dispute between Lucas and Marcia over how to present climate change to the Mineiro government is an example of the complex hybridity of the relationship between science and politics, as it was enacted at FEAM. It is vital to note that the environmental scientists were well-acquainted with the debate about science and politics through their educational backgrounds and current academic activities. From their own STS readings and publications, and the realities of working as a government scientist, the members of GEMUC were fully aware that science and politics are messily entangled. Given this atmosphere of political savviness, it would be naïve for me as an observer and commentator to suggest that the members of GEMUC need to better understand that "science is political." Rather than presume that STS has a key message to teach

them, we can consider the ways in which their reflexive understanding of themselves as "boundary workers" reveals what scientific and political practice looks when the interrelations between the two are assumed.

The "boundary" work of GEMUC and FEAM can be viewed as a paradigmatic case of an emerging "technopolitics:" "a process of manufacture whose ingredients are both human and nonhuman, both intentional and not, and in which the intentional or the human is always somewhat overrun by the unintended" (Mitchell 2002, 42–43). Approaching "boundary work" as technopolitical means bracketing the assumption that science and politics must oppose each other or that science ought to be controlled by politics. In FEAM's domain of action, science always already entangles politics and politics always already entangles science. At a certain point, it may no longer provide analytic leverage to distinguish between the scientific and political roles of FEAM.

In the absence of a conceptual conflict, our attention might more easily find those new, fragmentary or nebulous domains of thinking and action that may allow us to more effectively address the ambiguous horrors of climate change. Reconciling science and politics was particularly fraught in the years leading to Bolsonaro's election as tension grew between democracy and scientific expertise. Following the political, economic, and environmental upheavals of 2016, popular support for democracy in Brazil precipitously declined. In surveys conducted between 2017 and 2018, public approval of democracy fell by 9%, resulting in only about a third of Brazil stating that democracy was their preferred form of government. While this trend generally holds across South America, it was more pronounced in Brazil ("Informe 2018" 2018). Brazil's last military dictatorship, which lasted from its coup in 1964 to its fall in 1985, figures prominently in the public imagination. Despite a violent record of torture, environmental

destruction, and mass exiles, the dictatorship still holds a promise of social stability, security, and a steady march towards development. Positive portrayals of the dictatorship in the media and in schools resulted in growing public support for military rule. This support especially flourished among supporters of the presidential candidate Jair Bolsonaro, an army captain who frequently alluded to the perceived stability and economic advantages of military dictatorships (Filho 2018).

Censorship blocked information about the abuses of the military government and contributed to nostalgia for the dictatorship and, by extension, growing dissatisfaction with democracy. For example, in December 2017, the *Universidade Federal do Minas Gerais* (UFMG) in Belo Horizonte planned to open a museum exhibit about the history of the dictatorship's abuses. Knowing that the content would be divisive and politically sensitive, the organizers of the exhibit requested optional approval from the Ministry of Justice. Despite receiving the ministry's financial support, the Federal Police accused UFMG of embezzling BRL$4 million (approximately USD$1.2 million) into personal accounts as the opening of the exhibit approached. With helicopter air support, the Federal Police raided UFMG's campus at midnight to arrest 11 administrators, including the rector, vice-rector, and the president of a research association (Nascimento 2017, fig. 7). Many of UFMG's faculty were furious, alleging that the militarized arrests were politically motivated and staged so that the media could frame the

Figure 7: Image from the Federal Police operation at UFMG, 6 December, 2017. The text reads, "In total, there were 11 arrest warrants." (Nascimento 2017)

administrators as dangerous criminals, further demonizing higher education and positioning the police as the enemies of corruption (UFMG 2017).[14]

The growing dissatisfaction with democracy presented a challenge to GEMUC's scientific advisors because their work relied on the support of Brazil's democratic institutions. Building on the legacy of *socioambientalismo*, most of my interlocutors at GEMUC valued democratic institutions and egalitarian politics. However, as a growing section of the population expressed skepticism about climate change, some analysts expressed their dissatisfaction with the democratic distribution of authority. As one analyst explained to me, many of the limitations imposed on environmental regulation originated from the state legislature, directly elected by "the people (*o povo*)." As part of the executive branch, FEAM was "held captive by the legislature." According to this analyst, political posturing and corruption among the legislature resulted in dramatic shifts in funding and priorities for the lower-level executive offices like FEAM. While he never explicitly said as much, I could not help but wonder if he wished for an executive branch untethered from the popular will. If so, his yearning for a release from legislative captivity would place him much closer to the authoritarian critics of democracy than to the *socioambientalistas* of the past.

Knowledge Beyond the Science-Politics Boundary

The various challenges to climate science and democracy in Brazil affected the daily work of GEMUC. As I will show in this section, the labour of climate advisors frequently transgressed the boundaries of science and politics, reworking those categories into a new form.

[14] Reflecting on the tense relationship between Brazilian scientific institutions and the Bolsonaro government more recently, Marko Monteiro writes that "many in universities feel pushed up against the wall with no way out" (2020, 5). Attacks against universities continue, evidently not confined to any particular presidential administration.

My clearest indication of a new form of science and politics taking shape came when I interviewed Michel just as he was transferring to GEMUC from another section of FEAM. His move into GEMUC occurred near the end of my fieldwork as personnel shifts created new openings. He was well liked throughout the organization, with many praising his solid understanding of the environmental and physical dynamics of climate change. Beyond that foundation, he was also a gifted coder and easily worked with the variety of software that has become increasingly significant in environmental governance. Like many of the men[15] in GEMUC, he had studied geography in school and had long been fascinated by the outdoors and the environment.

As with many of my interviews, I started with the simple "idiotic" questions (Stengers 2005) such as "What do you do?" As Michel explained the basic aspects of his job, he summarized the role of scientific advisors as one of translation, explaining that "we turn data into information." I asked him to explain what he meant. "Data," as he explained, were the "raw" facts gathered by monitoring stations, satellites, government reports, and other sources. Frequently, data are "just numbers."

Data appears "natural" or unquestionable because it is seemingly quantifiable and objective. However, anthropologists Xin Liu (2012) and Cal Biruk (2018) have demonstrated that the practices of gathering and creating data can be extraordinarily intricate. Data is not an object naturally existing in a pregiven form. A wide range of observers create data through their interactions with things, people, and environments. Observers shape the data into comprehensible forms which are mediated through the observer's heuristics. For example,

[15] In a later chapter, I will address the gendered differences in the training and work of GEMUC's analysts. As a quick summary, most of the men in GEMUC were trained in physical geography while the women were trained in engineering or social geography.

meteorological data might seem like a straightforward report on rainfall amounts, but it relies on a network of dispersed monitoring stations staffed by many people who provide reports in different formats. All this data needs to be collected and standardized to create a coherent dataset. Analysts like Michel knew that gathering data was not a simple process, but his quick explanation left these complexities aside.

In Michel's understanding, information is the politically actionable role of data. Data is condensed, filtered, and communicated in such a way that a politician or an activist can *do* something with it. Information is pragmatic. It is defined by its capacity to facilitate action. Translating data into information entails providing a clear sense of what the data can accomplish or what actions would help to alleviate a problem. This process of translation occurs before members of GEMUC ever present their work to other offices, agencies, or audiences. According to Michel, it is the core day-to-day task of FEAM analysts to take in data and generate information.

For much of contemporary climate science, the sources and types of data vary from meteorological records to geological indicators to industrial activity reports. Environmental science today works with a systematic and holistic conception of ecosystems. This conception presents ecosystems as cohesive, complex systems with established rules and regularities (Willis 1997; Taylor 2011; Satsuka 2015, 196). To approach land as an ecosystem requires viewing the environment as a heterogenous assemblage of different kinds of beings and processes, each requiring their own form of inquiry in order to be understood (Ogden 2008). For instance, studying ice cores requires very different practices than tabulating wildlife populations. Therefore, while a systems approach to environmental science may seem like an appeal to a

unified or holistic picture, the practical consequence of this approach is a fracturing and multiplication of the various kinds of data involved.[16]

GEMUC generally did not generate its own data. Most of the data it worked with comes from municipal offices and monitoring stations that deliver the vast amounts of data to the state government, which then makes that data available to the state analysts. This process imposed two important limitations. First, the data that arrived at the GEMUC office varied not only in content, but also in form. One set of data may have come from a city's environmental advisors who work closely with FEAM and know the standards the state expects from data. Other data sets, in particular local water quality reports, might have come from concerned citizen groups with ambiguous degrees of scientific expertise. The data needed to be standardized before it could be processed into information.

The dispersed and decentralized data production also forced GEMUC to navigate local and municipal political institutions. Frequently, analysts could not access a desired data set because their local counterparts requested political and financial incentives in exchange. If a data source did not perceive the exchange as worthwhile, they would not send the requested data. This limitation was particularly frustrating for state analysts when evaluating the effectiveness of their municipal training programs.

One the climate analysts' regular tasks was to travel around the state presenting their work to various municipal offices. The goal of these presentations was to "build capacities" for climate change adaptation by educating municipal governments on the tools and strategies

[16] The creation of a holistic soil science serves as an example. Initially split between different disciplines such as microbiology and geology, the creation of a holistic category of "soil" in the 1950's placed new demands on these older disciplines to collaborate (Lyons 2014; de la Bellacasa 2014). This history demonstrates that the theoretical distinction between holism and particularism which has preoccupied anthropology may not hold significance for scientific practice. Rather than disputing the solidity or instability of ecosystems or soil as singular entities, we might instead inquire into the diverse modes of inquiry and practice these entities engender.

available to them. I frequently asked members of GEMUC if their various educational programs were helpful. Cheerful reports about the details of the session, the questions they got asked, the people that they met, and the size of the audience would give way to much more vague musings of their long-term effectiveness. “We just don’t know,” one analyst finally explained to me. Measuring the effectiveness of these programs frequently fell outside the budget of FEAM. Follow-up studies rarely occurred, and in the cases where a study had been conducted, the municipalities tended to guard the results closely because they were nervous about excessive state oversight.

There were limitations to obtaining global data as well. When GEMUC considered joining global non-governmental organizations like the Carbon Disclosure Project or the International Council for Local Environmental Initiatives, the promise of access to larger data sets provided one of the most appealing benefits. Many of these organizations required data and money as a price of entry. At both the local and the global level, data emerges as a form of valuable and limited currency.

Due to the importance of data, GEMUC’s first task after their creation in 2007 was to collect and compile data from around the region. As its first major action in 2008, GEMUC composed a state-wide inventory of greenhouse gas emissions using 2005 as a baseline year. GEMUC also used this opportunity to form their first international partnership with the French department of Nord-Pas-de-Calais in order to assist with the technical and methodological difficulties. The creation and afterlife of this report demonstrates many of the difficulties of creating data and translating it into information.

While it might be easy to understand greenhouse gases as concrete entities existing “out there” in the world, a greenhouse gas inventory posed a significant technical challenge. First, the

ephemeral material qualities of gases mean that it can be difficult to observe and quantify the gases that have been emitted. Rather than rely on air samples that change from day to day and from location to location, GEMUC needed to establish a historical estimate of gas emissions from a variety of sources. As a second challenge, there are many different gases that trap heat in the planetary atmosphere. GEMUC's inventory tracked five in particular: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane (CF_4), and hexafluoroethane (C_2F_6). While these gases are significant components of the greenhouse gas effect, it is important to note that this list did not include other prominent greenhouse gases like water vapour and ozone (Manabe 2019). Regardless, even the reduced number of gases included in the inventory required GEMUC to observe many different possible sources in Minas Gerais.

As a result of the difficulties of directly measuring greenhouse gases, GEMUC and its collaborators needed to identify the possible emitters of the gases. Suddenly, what seemed like a simple question of tallying the amount of a gas in the air descended into almost maddening complexity. In an article discussing management of access to healthcare after the Chernobyl disaster, Adriana Petryna (2009) noted the ways in which the Ukrainian state and medical apparatuses sought to manage the complex ramifications through a series of scientifically-guided claims that nonetheless exceeded the scope of complete scientific knowledge. By making simplifying claims, Ukrainian doctors where able to gain some degree of control over an essentially uncontrollable event. Likewise, to manage the complexity of greenhouse gases, GEMUC made a simplifying reduction. They identified four "sectors" of emitters: energy, industrial processes and products, land use, and waste management (fig. 8).

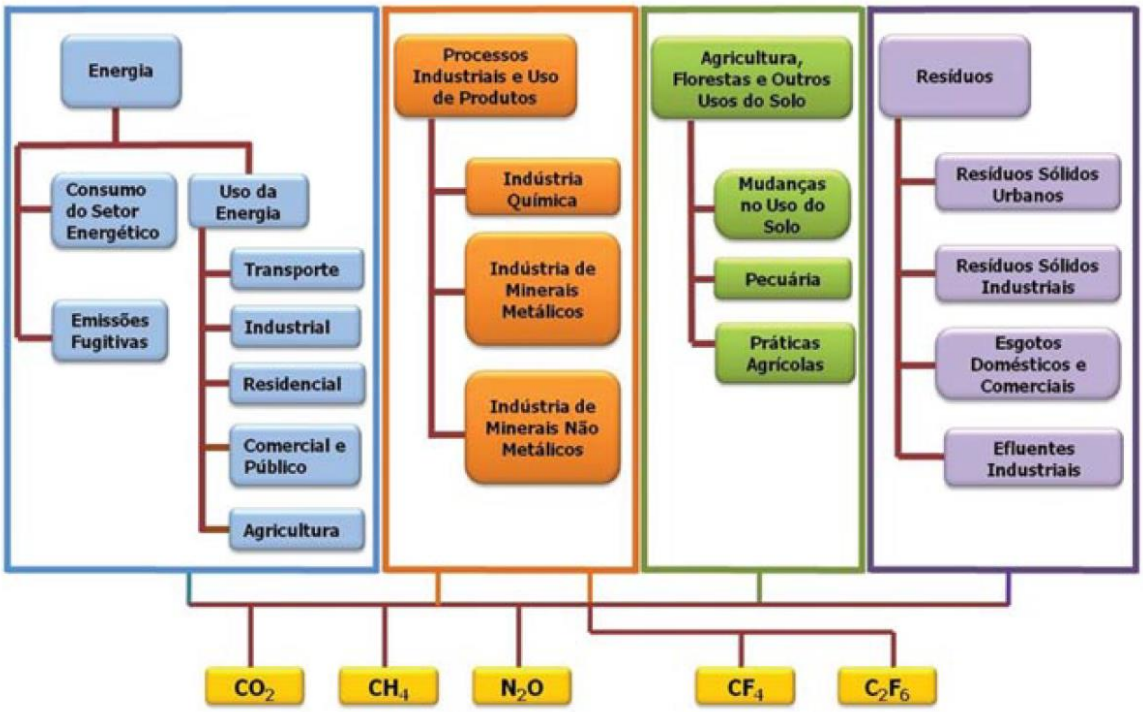

Figure 8: Sectoral diagram from (*Fundação Estadual do Meio Ambiente* 2008, 10).

Each of these four sectors was further broken down into component parts, many of which are themselves composites of different types of emissions. The taxonomy can continue seemingly indefinitely. For example, the "energy" sector breaks down into three components: the consumption of energy in the production of more energy, "fugitive" methane emissions from natural gas, and energy use. That last category breaks down into five more subsections: transport, industry, residential, agriculture, and commercial and public energy use. Of those sections, industrial energy use was further divided into at least 10 different types of industry.

For each of these subsections (or sub-subsections, etc.), GEMUC needed to find a source which could give them reliable data on the amount of greenhouse gases emitted. These data sources could be self-reported by various industries, or they could be composed by GEMUC analysts working with an understanding of the chemical processes involved. After hundreds of

sources of data were collected, verified, synthesized, and analyzed, GEMUC was able to produce a deceptively simple piece of information: "The total greenhouse gas emissions in Minas Gerais, in 2005, were 122,950 gg of CO_2eq" (*Fundação Estadual do Meio Ambiente* 2008, 14).[17]

There was still more translation to be done. A Mineiro academic familiar with GEMUC's work and international climate conferences told me more about what happens with these kinds of gas inventories. Minas Gerais' inventory provided a foundation for GEMUC's later work. Greenhouse gas estimates make for easy headlines because they appear to succinctly summarize the severity of the climate crisis. The estimates also serve as the starting point for international agreements to reduce emissions. For example, when the 2016 Paris agreement called for Brazil to reduce its greenhouse gas emissions by 38% by 2025 compared to 2005 measurements, GEMUC's inventory was one of many estimates used to establish these goals.

However, the methodological complexity of emission estimates provides skeptics and critics an opportunity to derail actions. As more data emerges and new methods for estimates arrive, the emissions estimate may change. GEMUC conducted a second greenhouse gas inventory in 2014 based on 2010 data. This second study revised the earlier 2005 baseline estimate to the slightly higher number of 124,167.3 gg CO_2eq and recorded the 2010 amount as 123,434.3 gg CO_2eq (*Fundação Estadual do Meio Ambiente* 2014). In the 2014 report, GEMUC concludes that Minas Gerais decreased emissions by .6%. If, however, GEMUC had continued to use the 2008 report's estimate, they would have concluded that Minas Gerais increased emissions by .4%. Given this wavering, a participant in the state's ongoing negotiations about implementing the Paris agreement expressed frustration that political opponents used the new estimates to delay conversations. A 38% reduction in Minas Gerais emissions based on the 2008

[17] In other words, the equivalent of 122,950 gigagrams of CO_2.

estimate would require the state to emit less than 76,229 gg CO_2eq by 2025. If that data has since been updated, the skeptics asked, should the new target be 38% of the 2014 estimate (76,529 gg CO_2eq) or should the target emissions remain the same despite now calling for a slightly larger percentage (38.24%)? While these two targets might seem so close as to functionally be the same, the mere existence of a doubt allowed for negotiations to be drawn out.

Relating these frustrations to me, the scientist lamented that it was easier for sociologists to see if a social program was effective than to deal with greenhouse gas estimates. This surprised me, given the frequency with which social scientists describe their work as interpretive and inconclusive (e.g. Geertz 1977). I had thought that the natural sciences were supposed to have clear answers or that their reports were perceived as "objective." When I expressed my surprise, he explained that if you wanted to know if a social policy affected the crime rate or the poverty rate, you only needed to look up the reported statistics. One would only need this one source to understand if the policy had been effective or not.

Setting aside the methodological concerns a sociologist might raise about the completeness of this kind of research,[18] his frustration about the perceived simplicity of social science data compared to the complexity of environmental data may stem from the peculiar situation of FEAM's analysts. Unlike the laboratory science that served as the paradigmatic cases for the development of STS (Latour and Woolgar 1986; Traweek 1988; Rheinberger 1997), GEMUC could not rely upon controlled experiments or observation for their data. Rather, their data collection relied upon collaboration across numerous institutions and actors and required a large degree of trust.

[18] I am setting aside these concerns because the comment was made off-hand. I include it here not because I wish to engage in a debate, but because the comment led me to reflect upon the kinds of data environmental science relies upon.

While certainly realist, FEAM's implicit epistemology is not a kind of subjectivist empiricism. They did not rely on personal experience to learn about the world. Instead, GEMUC scientists relied on political and economic institutions like the ministries of health and municipal security offices to provide empirical data rather than doing empirical work themselves. The systems approach of environmental science provided them with a form to translate the multitude of data into information. In this epistemic practice, political and scientific systems cannot be isolated from each other.

Complex Vulnerabilities

As a result of FEAM's synthetic and systematic approach to environmental data, traditional boundaries between science and politics as well as between nature and culture fade away. This was also demonstrated in GEMUC's 2014 statewide climate change vulnerability assessment. In combination with the greenhouse gas inventory, the 2014 vulnerability assessment comprised the "first phase" of GEMUC's broader project that culminated in the 2015 *Plano de Energia e Mudanças Climáticas de Minas Gerais* (PEMC), the Minas Gerais Energy and Climate Plan[19]. The vulnerability assessment used the emissions inventory as a foundation for understanding what Minas Gerais could potentially do to mitigate climate change. It also evaluated how and to what degree the state of Minas Gerais is susceptible to the effects of global climate change.

[19] It is significant that the PEMC was a "plan" and not a "policy" or "law." While the PEMC was approved by the legislature and governor as a set of priorities, it is not enforceable or binding. In interviews, GEMUC members expressed a desire to eventually create a stronger legal framework for environmental protections, but such actions went beyond the scope of their advisory capacities. Laws would need approval by the legislature and governor. As such, legality itself occupied a spot on the horizon – an ideal the reach towards but out of reach within the existing institutions.

The central figure of the report was the concept of "vulnerability," which is itself a heterogenous object derived from both Brazilian *socialambiental* sensitivities and international environmentalist institutions. Conforming with the hybridity of Brazilian environmentalism and quoting the 2007 Intergovernmental Panel on Climate Change (IPCC) report, GEMUC defined "vulnerability" in their 2014 report as such:

> Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, the sensitivity and adaptive capacity of that system (IPCC 2007, 6 qtd. in *Fundação Estadual do Meio Ambiente* 2015a, 12).

For GEMUC and many other disaster management experts (Polsky, Neff, and Yarnal 2007; Quintão et al. 2017), vulnerability is essentially a tripartite entity (fig. 9). The first and most straightforward element of vulnerability is exposure to hazards. A region may be more vulnerable by virtue of its geography placing it in the path of oncoming disasters. For example, coastal states may be vulnerable to rising sea levels in ways that landlocked Minas Gerais is not. The second component of vulnerability is the sensitivity of a population or region to disasters. For example, the technocratically planned downtown of Belo Horizonte, with its even grid of roads and drainage systems, is much less susceptible to flooding than more haphazardly constructed neighbourhoods. The same rainfall on both areas of the city may result in dramatically different amounts of damage. Finally, contemporary definitions of vulnerability include the ability of a population to adapt or respond to disasters. Vulnerability to an epidemic, for instance, is lower if a population has quick and ready access to healthcare.

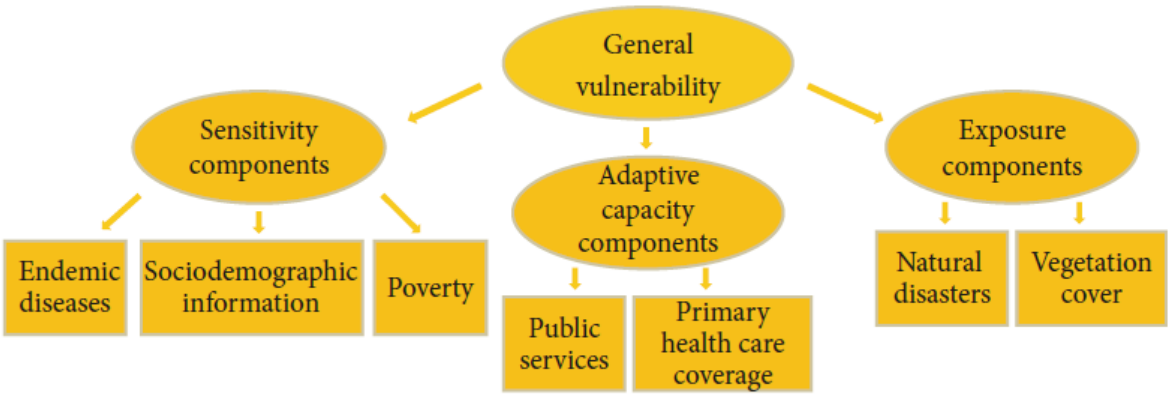

Figure 9: Vulnerability as constructed in Minas Gerais (Quintão et al. 2017, 3).

This conceptualization of vulnerability is relatively new within the disaster management literature. In the 2005 Hyogo Framework for Action, composed by the United Nations World Conference on Disaster Risk Reduction following the devastating 2004 Indian Ocean tsunami, vulnerability was defined as "The conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards" (United Nations Specialised Conferences 2005, 4). This definition encompasses sensitivity and exposure, but excludes adaptive capacities, which were considered as a separate issue. The inclusion of adaptive capacities within the definition of vulnerability mirrors the shifting paradigms of disaster management since the 1990s. Previously, the global literature tended to view disasters as discrete moments in time that demanded responses. More recently, disaster management literature has prioritized the historical processes that shape vulnerability to disasters before, during, and after the hazard occurs (Gupta and Nair 2013, 416). This transition brought greater attention to institutional and public capabilities included in the new definition of "vulnerability."

For GEMUC, the expansive construction of vulnerability from the disaster management literature approximated the concerns of *socioambientialismo*. The vulnerability assessment encompassed evaluation of things such as public policy, quality of healthcare, accessibility to media for disaster alerts, and sanitation systems, as well as geographic questions concerning disaster incidence and exposure. "Vulnerability" drew on "natural" and "political" elements without concern for their supposed conceptual distinctiveness. In the pages of the assessment, it is difficult if not impossible to draw the boundary line between those domains.

Composing the vulnerability assessment demanded that GEMUC consider questions of considerably higher complexity than their earlier work. Like much of contemporary environmental science (Edwards 2016), they relied upon intricate computer modeling software to accomplish this task. Climate modeling allows scientists like GEMUC's analysts to input vast arrays of data and to harness copious amounts of computing power to generate specified pieces of information. As one exploratory paper authored by FEAM analysts explains, the complexity of something like a vulnerability assessment or climate change projections frequently requires the use of more than one type of computer model (Xavier et al. 2013). For the vulnerability assessment, GEMUC used the PRECIS (Providing Regional Climates for Impact Studies) model developed by the Hadley Center in the United Kingdom for global projections as well as the BHC (*balanço hídrico*) model developed by UFMG in order to generate more granular scenarios for the future Mineiro climate.

There are some serious challenges with this kind of mechanized analysis. Given their complexity, these technical models might seem to be a radical form of scientific "black boxing:" "One need focus only on its inputs and outputs and not on its internal complexity" (Latour 1999, 304). True to this understanding, I struggled to get any of GEMUC's analysts to explain their

models to me in specific terms. Everyone seemed to become a resolute pragmatist when it came to computer models. All that mattered is that they worked. These curt answers may have been due to my own ignorance of the computer science or mathematics involved in the construction and operation of these models, but it is also important to note that the essential goal of these models is to conduct analysis at levels of complexity that would be unwieldy for mere human beings. Understanding a model does not mean that one could do without the model's assistance. The irreducible complexity of climate modeling can pose a barrier to non-specialists hoping to get involved with climate governance if they lack access to adequate computing power and technical skills. However, this does not mean that climate modeling is anti-political.

Computerized climate models construct their own forms of politics in the ways that they relate beings together. As the case of the vulnerability assessment demonstrates, climate models do not distinguish between "natural" and "cultural" sets of data. Whether the data comes from measuring atmospheric compositions or human migration patterns makes little difference. The ultimate evaluation of regional vulnerabilities in Minas Gerais incorporates elements that could be considered as either one of these categories without distinction. One would be hard-pressed to "purify" these climate models by separating out the natural and cultural sets of data. By increasingly the expertise required to work with these complex models, the heterogeneity of the vulnerability assessment can create its own new forms of practical challenges.

Conclusion

Where does all this complexity leave GEMUC's vulnerability assessment? Like the greenhouse gas inventory, the multidimensionality of the vulnerability assessment required multiple sources of data, from an even broader range. Measuring vulnerability transcends

"natural" scientific categories and incorporates socioeconomic and political data. This creates new types of interactions that can easily be missed by dualistic methodologies. Complex systems analysts are well aware of material feedback loops, like the relationship between polar permafrost melting and methane emitted from those melts (Leahy 2019), but the heterogeneity of vulnerability introduces new kinds of feedback loops. As FEAM analysts explained in a paper on environmental modeling, "feedbacks across the economy, society, and environment are difficult to identify, manage, and quantify, especially with conventional methodologies and models" (Xavier et al. 2013, 3).

As an example of a complex feedback loop, the vulnerability assessment found that the northern, poorer agricultural regions of Minas Gerais had fewer resources to address climate change related disasters. This finding conforms with broader studies on the intersections of race, class, and environmental risks (e.g. Gravlee 2009). The assessment further found that droughts due to climate change will more likely and severely impact regions that economically rely on agriculture. Therefore, as the impacts of climate change intensify, the northern regions of Minas Gerais, which are already the most vulnerable, will only become more vulnerable. For many people in particularly affected regions, climate change spurs migration (Reuveny 2007). Many people from rural Minas Gerais have already started to migrate to Belo Horizonte and other major cities, further burdening urban infrastructures that are themselves vulnerable to environmental damage. Rapid wear on infrastructure, increased competition for employment, and more apparent misery in public spaces can serve to strengthen the arguments of authoritarian politicians, who themselves are likely to support policies which will intensify climate change. In scenario after scenario, the vulnerability assessment describes ways that immediate reactions to climate change only make the state more vulnerable to disaster in a vicious cycle.

The complexity of vulnerability and climate change belies the shortcomings of information translation in a rapidly changing world. In an ideal case, GEMUC would be able to gather the multitude of data and provide the Mineiro government with a clear indication of how the state is vulnerable and what can be done to address these vulnerabilities. In other words, the climate analysts would be able to translate "danger," the "empirical factors that exist in the world in a scientifically under-examined state," into a set of calculated and informative "risks" (Rabinow and Bennett 2012, 157). However, the inevitable unpredictability of complex systems poses a critical limit to this translation. Climate analysts will never be able to prophesize the future. All they can show is that the climactic system, including a host of human and non-human actors, will spiral out of control. The dangers of climate change can never wholly be translated into clear risks.

Earlier in this chapter, STS literature framed climate analysts' hybrid task as one of "boundary work" because of their position between science and politics. Here, however, we can see that the heterogeneity of addressing climate change encompasses more than just two domains. Human beings find themselves interacting with complex ecosystems, massive computational simulations, and historical socioeconomic legacies. Setting aside the framing of "boundaries," GEMUC's task does not look any less daunting. Rather than arriving at a place where the chaos of the climate crisis appears well-ordered, the work of data translation and the immense scope of complex systems analysis seem to have only provided a clearer picture of an endlessly troubling monster.

Chapter 3: ENEMIES AND EMETICS
Reconsidering Enmity in the Climate Crisis

"–Listen, faced with the living cockroach, the worst discovery was that the world is not human, and that we are not human. No, don't get scared! certainly [sic] *what had saved me until that moment from the sentimentalized life from which I'd been living, is that the inhuman part is the best part of us* […]*"*

Clarice Lispector, *The Passion According to G.H.*

She spots the cockroach darting out from the closet, interrupting her quotidian boredom. In her shock and disgust, she slams the door closed and slices the bug in half. Its entrails begin to seep onto the floor. She finds herself transfixed by the gore. She has wronged a living creature, and thus the world. Despite its different exterior appearance, the flesh of the cockroach now reminds her of her own body, of all bodies, of all matter. Images of her own demise, or the demise of all life, flash before her. Was this merely one cockroach? Was it herself? Was it God itself? The damage had to be repaired, but how? Things needed to be made whole again. "Redemption had to be in the thing itself," she thinks, as she brings the cockroach's viscera to her mouth, ready to make things whole by ingesting the mashed pieces. She swallows the flesh, but the dark sacrament, the totality of it all, is too intense for her merely human body. She vomits, and as her body forcefully separates itself from the cockroach, she snaps out of her trance and returns to her daily life (Lispector 1998).

This grotesque episode from the pages of Clarice Lispector's *A paixão segundo G.H.* [*The Passion According to G.H.*] demonstrates the temptations and limits of human communion with those alien entities with which we share our planet. G.H., the narrator and only human character, takes her desire for reconciliation between herself and the cockroach to the point of consumption, but recoils at the action.

In the previous chapter, climate analysts tried to use complex systems analysis and ecology to create a holistic technopolitical inquiry that overcame all boundaries, whether between "science" and "politics" or between various kinds of greenhouse gas emissions. However, they only found themselves mired in unimaginable complexity and terrifying feedback loops. Considering these flaws, is complete holism really the only way to approach the climate crisis? Is it necessary that analysis aspire to account for every minute detail of global climate change?

Many anthropologists have asked themselves a similar question: how do we make sense of sections of society differentiated from the rest? In Gregory Bateson's ethnography of the Iatmul, societies cleave into subgroups based on internal systems dynamics he calls "schismogenesis." Bateson's argument that group dynamics can create divergence is part of his contribution to early cybernetics, a major influence on the complex systems analysis used by climate analysts. Bateson describes schismogenesis through the example of the Iatmul's practice of boasting. By valuing competitiveness, ongoing boasting could eventually separate the group into two rival factions that viewed each other as enemies (Bateson 1958, 175–77). However, from the perspective of Bateson's systemic holism, the rival groups are actually reconciled into a broader whole because the cause of the separation remains entirely internal to the overall group. Holism harmonizes all moments of enmity, either practically or at least theoretically.

Claude Lévi-Strauss offers an alternative interpretation of enmity that does not reach reconciliation. In *Tristes Tropiques*, he speculates that there are two social approaches to otherness. He introduces the first through the metaphor of *anthropophagy*, or cannibalism, which involves taking the other into oneself (Levi-Strauss 1992, 388). An example of an anthropophagic society would be one that readily takes in outsiders and inducts them into the

community. Lévi-Strauss would likely characterize Bateson's holism as a kind of anthropophagy insofar as it views antagonism as a mere moment within a broader system. Lévi-Strauss' anthropophagy and Bateson's schismogenesis are both holistic systems in that everything is understood as part of a broader system.

Lévi-Strauss presents the other possible understanding of enmity through the metaphor of *anthropemy*, derived from the Greek "*emein*" meaning "vomiting." This approach erects a boundary and ejects the other from the self (Levi-Strauss 1992, 388). Anthropemic societies are guarded against the outside and may respond to internal conflict by "ejecting dangerous individuals" (Levi-Strauss 1992, 388). The separation of emesis is much more forceful that that in Bateson's example of schismogenesis. Once Lévi-Strauss' groups are separated, they no longer have a unifying system in common, and cannot be reconciled back into a holistic system. For Lévi-Strauss, the concept of emesis as enacted by anthropemic societies offers a way of thinking about the preservation of limits.

Taking G.H.'s vomit as an initial inspiration, this chapter follows Lévi-Strauss's example to provocatively consider the potential of an "emetic" investigation of the climate crisis. In an emetic approach, the enemy is ejected and set apart from the self. The act of regurgitation imposes strict boundaries between what is acceptable for the self and what cannot be tolerated. As Christine Folch states in discussing the purportedly emetic effects of the Yaupon plant, the emphasis on regurgitation "is a way to think" (2021, 497). Insisting on distance and limits may be a viable alternative way of thinking about the climate crisis instead of the all-encompassing morass of holistic reconciliation.

This chapter will proceed through three sections. The first will address those who, like G.H., seek to right the wrongs of the climate crisis through a (re)commitment to holistic systems.

This section will explore the critiques of enmity, and then present enmity as a form of differentiation that preserves exteriority. The second and third sections will examine two relationships of enmity in Mineiro climate politics: the Indigenous Krenak people's suspicious view of the Mineiro government and the conflictual relationship between diseased mosquitos and human populations. These two cases demonstrate that relations of enmity are not always problems that must be overcome, but can be essential components of addressing the horrors of the climate crisis.

Conflict Avoidance

Many anthropologists or philosophers concerned with environmental destruction and violence argue that unity and holism are the ideals humanity needs most. In this view, suggesting "enmity" could appear dangerously fascistic. This suspicion is worth taking seriously. One need only read the philosophical canon on conflict to understand their trepidation.

The invocation of enmity and conflict calls to mind Thomas Hobbes' *Leviathan* with its "war of all against all" that ends only with the creation of an absolute sovereign. In the Hobbesian account, the potential for civil war necessitated the creation of a sovereign entity separate from all considerations of morality or conscience, guided only by disinterested reason (Koselleck 2000, 33). For many others, including Giorgio Agamben (1998), Bruno Latour (2017), and Donna Haraway (2016), the paradigmatic philosopher of enmity is Carl Schmitt, the critic of liberal democracy and an enthusiastic Nazi. For Schmitt, politics emerges out of the distinction between the "friend," who must be preserved, and the "enemy," who must be eliminated (Schmitt 2007). He saw very few limits on the sovereign state in waging that conflict.

Both Hobbes and Schmitt describe a world where trust is inherently flawed, peace is accomplished only through violence, and political authority is absolute. If enmity inevitably leads to authoritarianism, it makes sense that political theorists valuing democracy would be nervous about valorizing conflict and would thus reject Hobbes and Schmitt's visions. At first glance, arguing in favour of enmity might appear like admitting defeat to authoritarianism and other anti-democratic forces.

Skepticism about enmity appears even in accounts seemingly open to conflict like Bruno Latour's *Facing Gaia*. Latour draws on Schmitt's friend-enemy binary to imagine a revolutionary war between nostalgically modernist "humans" and ecologically-minded "Earthbound," (2017, 117). The stake of this war is the fate of the Earth itself, which is being destroyed by modernist anthropocentrism. Conflict is necessary to establish an alternative *nomos*, or order, that allows for more-than-human life to flourish (Latour 2017, 119). However, even while advocating for war, Latour implores his audience:

> I beseech you not to conclude that I am smashing the ideal of universality; I recognize, I share, I cherish such an ideal: I am just trying to find a realistic way to realize it. And for this, first, we have to make sure that we don't think it's realized already. Just as Hobbes needed the state of nature to get to the social contract, we might need to accept a new state of war to envision the State of peace. (2017, 114).

The goal of the human-earthbound war is lasting peace. In other words, Latour's war is a means towards the end of peace. In this view, relations of enmity are only unfortunate and accidental moments in the planet's history that will eventually be resolved. In contrast to the kind of emetic relationships modeled by G.H., Latour's ultimate ambition is a preservation of a whole with "nothing external in it" (Latour 2017, 71).

Haraway seems to have been unpersuaded by Latour's vision of conflict being necessary for peace. Taking a stronger stand against conflict, she chastises *Facing Gaia* for its reliance on

Schmitt and the subsequent binary divisions between friend and foe (2016, 43). In lieu of war, Haraway proposes a grounding in the "tentacular" thinking of the "Chthulucene."[20] By emphasizing the weird, twisting connections between earthly beings, the Chthulucene offers Haraway a figure to replace the Schmittian friend-foe dichotomy. Haraway turns instead to Ursula Le Guin's "carrier bag theory" that collects bits and pieces "for collecting, carrying, and telling the stuff of living" (2016, 118). The carrier bag is expansive with plenty of "room for conflict" (Haraway 2016, 199), which makes Haraway's account seemingly more accepting of enmity. Within the carrier bag of the Chthulucene, Haraway ties the world together without promising a neat ending (2016, 125).

However, the expansiveness of the Chthtulucene eventually reveals itself to be incompatible with enmity. In Haraway's view, "All earthlings are kin in the deepest sense" (Haraway 2016, 103), and weave together in grand "sympoetic" becomings (Haraway 2016, 58). In a creative fiction piece that closes the text, Haraway imagines Camille, a human-caterpillar hybrid who befriends Kess, a human-kestrel hybrid, brought together because "they [Camille and Kess] knew kestrels ate butterflies" (2016, 149). The fact that a kestrel is dangerous for a butterfly is relegated to the distant past. In Haraway's story, predator and prey come together in harmony and live together in peace.[21] This is a fundamentally different kind of story than *A paixão segundo G.H.*

[20] The term "Chthulucene" is derived from the Greek-originated terms "Chthonic" meaning "earth" or "subterranean" and "*kainós*" meaning "now" but more generally used as a suffix for geological periods. Despite her repeated insistences that she did not intend the term as a reference to H.P. Lovecraft's "Cthulu" (note the missing "h") (Haraway 2016, 176n4), Haraway's repeated references to science fiction, mysterious "Chthonic ones," tentacles, monsters, and other features of cosmic horror strain credulity.

[21] This idyllic reconciliation between predatory and prey is not the only form of holism to include predation. Eduardo Kohn (2013) demonstrates how the relations of predation in the Ecuadorian Amazon are themselves components of larger "wholes," including biological evolution and the emergence of the Amazon ecosystem. Kohn's holism engages with predation in a fundamentally different way than Haraway. While Kohn's holism maintains the antagonistic relationship implicit in every individual instance of predation, it views those points of

The Chthulucene stories refuse enmity. Perhaps Camille really should be suspicious of the predator that appears to be a friend? Though Haraway claims that "symbiogenesis is not a synonym for the good" (2016, 125) and that "there is room for conflict in Le Guin's story" (2016, 119), the elements of enmity and animosity recede far into the background.[22] Like Latour, Haraway's ultimate goal appears to be an expansive and lasting peace. In the interest of avoiding violence, Haraway's vision tends towards a utopian vision of holistic reconciliation.

Both Latour and Haraway fundamentally desire peace as the end goal of political action. Enmity is only tolerated insofar as it arrives at this goal. What if enmity was not viewed as a means to an end, but an essential part of understanding the climate crisis? Two texts help me think through alternative approaches to enmity: the political theorist Chantal Mouffe and the anthropologist Eduardo Viveiros de Castro.

Throughout her writings, Mouffe places "antagonism" at the heart of politics, especially in the context of contemporary social movements and "radical democracy" (Laclau and Mouffe 2001; Mouffe 2006). In any genuinely pluralistic assemblage of subjects, interests and passions will necessarily differ. At times, interests will likely conflict, whether in the form of class conflict, anti-racist struggles, or the tensions between populism and elitism. Mouffe envisions democratic politics as the agonistic, i.e., conflictual, venue in which antagonisms can be addressed without resorting to annihilation of one side or the other. As Mouffe explains:

> It is not necessary to endorse entirely Schmitt's conception of the political in order to concede the strength of his point when he exposes the shortcomings of a view that

conflict as necessary components of earthly life. In contrast, Haraway's utopian vision downplays the importance of predation, imagining a future where predatory and prey abandon violence altogether.

Following Kohn, one could then argue that holism is thus not necessarily at odds with a focus on enmity. While it is true that such an approach is logically possible, my goal in this section is to consider how enmity has been overlooked and evaded by advocates of holism. I am not arguing that holism must be abandoned altogether, but that there are moments of the climate crisis that are better addressed through a more partial, emetic inquiry.

[22] However, in Haraway's "Cyborg Manifesto," the cyborg "has no truck with […] seductions to organic wholeness through a final appropriation of all the powers of the parts into a higher unity" (1996a, 150) Compared to *Staying With the Trouble*, the "Cyborg Manifesto" is much more open to ongoing conflict and enmity.

> presents politics as a neutral domain insulated from all the divisive issues that exist in the private realm. The liberal claim that a universal rational consensus could be produced by an undistorted dialogue, and that free public reason could guarantee the impartiality of the state, is only possible at the cost of denying the irreducible antagonistic element present in social relations, and this can have disastrous consequences for the defense of democratic institutions. To negate the political does not make it disappear, it only leads to bewilderment in the face of its manifestations and to impotence in dealing with them (2006, 140).

For Mouffe, preserving democracy requires appreciating rather than silencing antagonism. Democracy is only possible when one recognizes that a community will never fully agree with one another. Any community that ever did reach consensus would cease to have any use for democracy. So long as it is kept from excessive antagonism, enmity can be a sign of pluralistic vibrancy.

However, Mouffe's conceptualization remains mired in the Schmittian tendency to imagine enmity as a binary; one is either friend or foe. The work of Eduardo Viveiros de Castro, particularly *From the Enemies Point of View* (1992), expands this conceptualization of the enemy. Rather than enemies merely being that foe to be destroyed in war, Viveiros de Castro explores enmity as "a de jure structure of thought" (2012, 40) that exceeds traditional conceptions of dichotomous war. Paying close attention to the Araweté term "awĩ," which he translates as "enemy," Viveiros de Castro reveals that it is used to refer to rival human populations, predatory jaguars, and also spirits and divinities themselves: "*Awĩ* is not a substantive essence, but a position or quality" whereby the other is irreducibly distinguished from the Araweté (Viveiros de Castro 1992, 65). Enmity for Viveiros de Castro refers to a differentiating relationship rather than the pretext for violence. The Araweté will never become one with the *awĩ*, but they do not necessarily require each other's extinction. Practically and ritually, there can be other options for navigating relationships of enmity.

By emphasizing enmity as a means of preserving differentiation and as a necessity for pluralistic democracies, these texts by Viveiros de Castro and Mouffe taken together provide the tools for an "emetic" inquiry of the climate crisis. By emetic inquiry I mean research that accepts and respects the existence of limits and does not try to unify everything under one framework. Rather than attempting to reconcile or incorporate everything within a singular, congruous holistic framework, an emetic approach to the climate crisis treats moments of antagonism and conflict as vital indicators of limits. Emetic inquiry preserves the sense that there is an "outside" of inquiry that cannot or should not be subsumed.

In the following two sections, I will explore two such conflicts. The first is the ongoing tension between the Mineiro government, myself as an anthropologist, and the Indigenous Krenak. The second conflict revolves around the study of mosquito-borne disease. Here, scientific inquiry is subsumed into a conflict with the monstrous mysteries of a more-than-human, or perhaps even inhuman, world. In both cases, my analysis will seek to preserve the elements of conflict, exteriority, and finitude that characterize the emetic approach fleshed out here.

Becoming the Enemy

"What percentage of the Mineiro population is Indigenous?" The question was met by silence. The speaker shrugged in response. "I don't know," he eventually let out.

"How many Indigenous peoples are here?"

"I don't know."

"How many Indigenous languages are there?"

"I don't know."

"How can you talk about conservation and not know the first thing about Indigenous people?"

This heated exchange caught me by surprise. Since being told by a municipal environmental analyst that Belo Horizonte "did not have Indigenous people" because it "was a city," and therefore distinct from the rural areas where it was presumed all Indigenous people lived,[23] I had given up hope of hearing from Indigenous perspectives at government meetings like this, yet here I was witnessing a Krenak activist directly challenging a high-ranking member of the environmental bureaucracy to account for his ignorance about Minas Gerais' Indigenous peoples.

This was the fourth public session of the *Diálogos com o Sisema* [Dialogues with SISEMA, an umbrella term for the state's environmental agencies]. While ostensibly an opportunity for members of the environmental bureaucracies to publicly share their work, the audience was typically filled only with other government employees. A speaker at the front of the room spoke monotonously in front of a stock PowerPoint that had likely passed through an unknown number of previous presentations. Despite the title of the event, "dialogue" was rare. Most people sat reclined in their interlocked, black plastic chairs, staring at their phones during the presentations. Others milled about the room, audibly talking on their phones. Occasionally, someone would move to the front to take a selfie with the presenter in the background, smiling as they created visible proof that they had attended the event for their supervisors. Amidst this

[23] I discuss this exchange in more depth in chapter 1. In Brazil, like North America, Indigenous people are discursively linked to the past of South America as a wild, "untamed" region of nature. The logic therefore runs that as the country becomes more "modern" and urban, it becomes less Indigenous. This process of Indigenous erasure not only motivates land dispossession and violence, but it also serves to retroactively explain away the absence of Indigenous people in state and city politics.

general air of tedium, it was unexpected when someone from outside the government challenged that day's presenter, the director of the state forestry institute.

The challenger was Shirley Djukurnã Krenak, an Indigenous activist of the Krenak people. The Krenak people were among the most directly impacted by the Mariana dam collapse in 2015. Since the flood, Shirley and other Krenak have intensified their political activism, challenging the state response to the disaster as well as broader programs of resource extraction that dispossess Indigenous communities of their land.

I approached Shirley after the event, hoping to have a chance to learn more about Indigenous activism in Minas Gerais and their evidently fraught relationship with the environmental bureaucracies. Since most people attended with coworkers who quickly circled up after the event officially ended, it was not difficult for me to get Shirley's attention. I introduced myself as an anthropologist working with the *Fundação estadual do meio ambiente* [State Foundation for the Environment] and asked if she would have a chance to talk later. She quickly asked for my notebook and jotted down her name and phone number, asking me to get in touch on WhatsApp. I left the interaction excited for our conversation.

The next morning, I sent her a message reiterating my interests. The message went without response for a week before I received a series of links to YouTube videos. The Krenak had produced hours of film depicting interviews with Shirley and other activists. She sent me the videos with no further commentary or response. Watching Shirley passionately advocate for her communities in the videos, I was struck how unnecessary I likely seemed to her. What did she need me for? The Boasian anthropologists had imagined themselves as heroic representatives of Indigenous people (Jobson 2020, 7), but in the contemporary media landscape, the Krenak had no need for a junior anthropology student to act as their advocate. Furthermore, the violent

legacy of scholars like Napoleon Chagnon have produced a justified skepticism of the intentions of anthropologists throughout Latin America.[24] Even worse, I had introduced myself as affiliated with the very state she was fighting against.

At that moment, I felt as if I could not be trusted. I had become an enemy. To be respectful of her distancing, I never asked for another interview, but I watched any Krenak recordings I found on YouTube.[25] In hindsight, maybe I was being overly sensitive and letting anxiety get the better of me. Regardless, Shirley had provided me with a trove of information, even while seeming to hold back from a more traditional ethnographic encounter.

The first video she sent spoke of a warning ignored. Shirley sits on a bench in the *Praça do Papa* overlooking the hills surrounding Belo Horizonte, wearing a black and white graphic t-shirt. Unlike when I met her in person, her face is painted with red-orange lines the colour of annatto dye.[26] Speaking about the Mariana disaster, she highlights the failures of public and state audiences to listen to Krenak warnings:

> This is a disaster that my people already knew would happen because we've been fighting against this company for many years and making people aware of what would happen if it kept polluting the river. My father always said there was going to be a day when this river would cry blood, and that's really the proof. We, Krenaks, always went on television, to the newspaper, to talk about how important the river was for the communities, for my people. My people understand that it was not just running water, but it was a brother who was there, close to us, who helped us, healed us, who calmed us. But not everyone understands this, right? (Neiva 2016)

[24] Napoleon Chagnon conducted fieldwork with the Yanomami along the border of Brazil and Venezuela beginning in the 1960's, producing a series of popular books and films. He was the target of Patrick Tierny's *Darkness by El Dorado* in 2000. Tierney accused Chagnon of a number of misdeeds ranging from falsifying data to sexual violence and introducing diseases to a vulnerable population. Through the publicity of these allegation, Chagnon has become an infamous exemplar of unethical anthropological research. While elements of Tierny's allegations are debatable, Yanomami themselves have called for an end to anthropological research on their communities (Padilha 2010).
[25] The content of these videos informs my description of the Mariana Dam disaster in chapter 1. For examples of these videos, see (Neiva 2016; If Not Us Then Who? 2018; Terra Água Rede de Pesquisa 2018; Goya 2019).
[26] For a discussion of the strategic use of stereotypical markers of indigeneity in Brazilian Indigenous activism, see (Conklin 1997)

These warnings, based on Krenak knowledge and expertise, had come to nothing. By excluding Indigenous experience from regulatory decision-making, the Mineiro environmental apparatuses failed to prevent or adequately remediate a foreseeable mining disaster.

Shirley's invocation of kinship with the Rio Doce continues a longstanding tie between the Krenak and the river ecosystem. As Ailton Krenak, another community activist and writer, explains: "The Doce, which we Krenak call 'Watu,' our grandfather, is a person, not a resource like the economists say. He is not something that someone can appropriate; it is a part of our collective construction that lives in a specific place" (2019, 21). This construction of kinship with non-human entities echoes a recurring theme in global environmental politics as it engages with Indigenous activism. As the Métis scholar Michelle Murphy summarizes for a North American context, Indigenous groups have long articulated an alternative and more relational understanding of humanity's place within the environment, or in other words, "what happens to the water is what happens to its relations" (Murphy 2017, 497). Rather than understand humanity, fish, water, minerals, and mining chemicals as discrete entities that only incidentally interact, Indigenous activists in North America argue that entanglement and relationality are primordial conditions. Ailton Krenak similarly argued that contemporary Minas Gerais is "alienated [*alienando*]" insofar as "the earth is one thing and we [humanity] are another" (Krenak 2019, 10).

Yet what becomes of this expansive relationality in a (post)colonial context deeply riven with lines of enmity? In Ailton's account, overcoming alienation is not as simple as merely reminding the Mineiro government of its environmental entanglements. This form of change will require more than publicity. It will require power to face adversaries. Both Ailton and Shirley Krenak describe this point in different ways. For Ailton, the process of colonization instantiated

a "war without end [*guerra sem fim*]" between "civilization [*civilização*]" and the Indigenous communities it suppressed (2019, 14). These Indigenous groups appear as only "quasi-human [*quase-humana*]" who continue to reside outside the structures of an alienated domain, "insisting to stay out of this dance of civilization, technology, and control of the planet. And for dancing this strange choreography, they are removed from the scene, through epidemics, through poverty, hunger, and directed violence" (Krenak 2019, 34).[27] By transitioning from the language of war to the language of dance and choreography, Ailton suggests an alternative way of navigating enmity.

For Shirley, the Krenak response to the dam disaster is twofold: "we are looking for a new way to adjust, but without stopping our fight." The adjustment of ways of life takes place in conjunction with a fight. It was this continual fight that I witnessed in the *Diálogo com o Sisema* and that I worried may have led to her wariness towards me. Maybe that is why I did not continue reach out to Shirley after she sent me the videos. Methodologically, this worry posed a significant challenge to my work. Surely, I should have reached out to her again if I did not want to become further complicit in the expulsion of Krenak from environmental governance. If her refusal to talk to me was the result of her enmity with the state, of which she maybe saw me saw me as a representative, would it be methodologically sound for me to allow that refusal to stand?

In her ethnography of black female high school students in San Francisco, Savannah Shange faced a similar tension. Asking Tarika, a student at the Robeson Justice Academy, if she

[27] I was reminded of Ailton Krenak's reappropriation of the dehumanization of Indigenous communities in January 2020, when Bolsonaro announced alongside his environmental minister Ricardo Salles that Indigenous people were "still evolving" into human beings (Valente 2020). Indigenous groups and their allies immediately challenged the racism of Bolsonaro's comment, but the satirical publication Sensacionalista responded with the head: "Indigenous say that they do not want to become humans like Bolsonaro [*Índios dizem que não querem se tornar humanos como Bolsonaro*]" (Zorzanelli 2020). Ailton Krenak's claim can be understood in a similar vein. What is the form of "humanity" defended by someone like Bolsonaro, and should Indigenous groups be ashamed at all to be excluded from that category?

would consent to being an ethnographic subject, Shange is told "You can follow me, but I'm not going to talk to you" (2019, 15). Like my interaction with Shirley, Tarika both invited Shange to learn from her and maintained a distance. Echoing Audra Simpson's (2014) analysis of Indigenous "ethnographic refusal," Shange reflects on the methodological and ethical challenge Tarika's response poses to ethnographers:

> Built into the genre of ethnography is an expectation of narrative thickness, a rich tapestry of voices that leaves the reader satiated by the elegant rhythm of *I saw, she said, I saw, she said*. The "right" way to end this essay is with a pithy quote from Tarika, an emic insight that could stand in for twenty-odd pages of academic grandstanding and simultaneously give me cred as a community-accountable ethnographer who gives her research participants the last word. But to reach out to Tarika with the intent of hearing her perspective, even in the interests of a putatively liberatory ethnographic project, still demands access to Black girl interiority as the price to ride on the freedom train. […] Perhaps here I fail as an anthropologist, and the petticoat of my disciplinary drag is showing. But *I sense there is more explanatory power in Tarika's agentic absence, in the opacity of not-knowing, than I would find tracking her down (like a runaway) and feigning a complete circle of analysis.*(2019, 15, emphasis added)

For Shange, "not-knowing" is not the end of inquiry. It is through respecting Tarika's limits that she comes to a better understanding of the Robeson Justice Academy. Likewise, my encounter with Shirley and her refusal to speak with me further demonstrates the limits of the relationship between Indigenous communities and the state. In her distancing, Shirley exemplified the "incommensurability" (Tuck and Yang 2012, 28) of Krenak and Mineiro state well-being. Resisting incorporation into an academic or state-endorsed project can be understood as an instantiation of broader Krenak assertions of sovereignty independent from Euroamerican institutions. Through this assertion, the Krenak remain exterior to these institutions.

While I might have sought to convince Shirley of my good intentions or wear her down with persistence, such attempts to "transform [her 'no'] into a 'yes'" (Shange 2019, 16) would have made myself complicit in a discipline that has often treated Indigenous knowledge and objects as the rightful property of Euroamerican audiences. The desire for totality would

transform into anthropophagy (de Andrade 1928). This is why an emetic inquiry, one which respects the limits of research and preserves the exteriority of irreconcilable others, is a necessary tool for addressing the place of Indigenous communities in the climate crisis.

If there is any value in emetic inquiry, it is to show that the presence of agonistic limits are necessary ethical and epistemic conditions for inquiry to continue rather than treating refusal as a hurdle to be eventually overcome or as the end of the research. The real conflict between Krenak sovereignty and my own desire to understand highlights the uneven terrain of the Mineiro and global climate crisis. Enmity does not only take the form of antagonistic foes locked in conflict. As Viveiros de Castro demonstrates, it can also take the form of incommensurable differentiation.

An Alien Comes to Earth

Luis came to meet me at a bar downtown after work wearing a black-and-white keffiyeh over a casual white tee-shirt and jeans. His short beard and scruffy hair were clearly well-styled but perhaps unattended for a few days. Luis was a microbiome expert at the Oswaldo Cruz Foundation, a public-health research institution that had recently made headlines for producing a yellow fever vaccine in Brazil. With the surge in mosquito-borne illnesses, Luis was working to determine the relationship between mosquitos and the bacteria that surrounded them: in their bodies, on their surfaces, and most importantly, in their environments.

Luis had taken a meandering path to arrive in Belo Horizonte. Originally from Guatemala, Luis had worked with teams of forensic anthropologists organized by Clyde Snow (the "founder of forensic anthropology," Luis proudly tells me) searching for mass graves after the 1954-1966 civil war. At the time, his hope had been to find characteristic bacteriain topsoil

that might indicate human remains below. It was not obvious that such a feat would be possible. Soils are host to an enormous variety of microorganisms that are affected by local vegetation, temperature, humidity, soil composition, and many other factors. Finding bacterial signs of human remains amidst this noise was enormously challenging. Luis was ready to give up on the hypothesis until he chanced upon an article in a dentistry journal. The article demonstrated that human teeth retain their unique microbiome for years after death. Waving his arms excitedly, Luis explained his finding, "then I said 'Aha!' I can apply the same principle of forensics to microbiota." He made sure to emphasize the consequence to convince me and himself both that his ecstatic transgression of disciplinary boundaries was reasonable: "*I'm not crazy* because dentists already proved that there is a way." If bones could possess a unique bacterial signature, it was possible that these bacteria propagated through the soil.

While plausible, Luis was never able to make the method work. However, during this time, he developed the skills and expertise to study microbiotic factors in dire public health settings. Now, Luis was using that same attentiveness to the microbiome to study how mosquitos altered the bacterial landscape of bodies of water to create hospitable receptacles for their eggs. If mosquitoes remade their bacterial surroundings, perhaps the microbiome could provide an avenue of mosquito control.

Luis' team hypothesized that mosquito larva needed the microbiotic ecosystems of their aquatic nurseries to fall within specific parameters. If they could understand those conditions of "niche construction," then there would be potential options for disrupting those ecosystems by introducing or removing certain bacteria, thereby making the area unsuitable for mosquito reproduction. The research could also help understand the interaction between mosquitos and the microorganisms they pass to other animals, like malarial parasites and the yellow fever virus.

As the Red Hot Chili Peppers blared over the bar's speakers, I asked Luis about the timing of his research. "I know that anything we produce could be useful, but it's not at all the objective of our project," he said, as he positioned himself as a "basic researcher," one who was not dedicated towards a particular technical end but simply wanted to learn more about the world. Luis hoped that his research would yield a better understanding of the relationship between mosquitoes and bacteria. Ultimately, that understanding might explain why some types of bacterial infections in mosquitoes had been observed to prevent the spread of the Zika virus. The use of bacteria in combating Zika, a process called "paratransgenesis," has been well documented. However, as Luis confessed to me, "*We have no clue how it happens*. It's our best hypothesis but we're not sure of the mechanism. We really don't have a certain idea of how these bacteria make the mosquito incapable of transmitting these viruses."

His confession took me by surprise. If one listens to the critiques of science and technology studies (STS) since the 1980s, scientists like Luis are supposed to be naively invested in an idea of objectivity that "defines science" (Daston and Galison 2010, 17). In this narrative, science supposedly tells a story of itself as offering a royal road to the truth. Yet as Donna Haraway observes, very few scientists actually work under this assumption (1996, 184). As I was quickly learning from Luis and others, the advertisement of science as objective truth held sway in theoretical polemics and popular imaginations of science, but meant little to many practicing scientists. With very little prodding, Luis was ready to forgo the pretension of "absolute Truth." In its place, Luis instead turned to the curiosities of scientific inquiry and the thrill, or challenge, of facing the unknown.

There seems to be something about insects that make them excellent focal points for passionate and curious science. During the European Enlightenment, entomologists shifted their attention from testifying to the goodness of God's creation to the curiosities of nature. In her study of these early "natural" scientists, Lorraine Daston finds numerous examples of observers so moved by the activities of insects that they became obsessed. Entomologists like André Deluc and René de Réaumur seemed to derive visceral pleasure from their observations. Jan Swammerdam, a Dutch biologist, wrote of his joy observing the "'beautiful appearance' of a dissected caterpillar, 'especially as the pulmonary tubes were at the same time observed to glitter like pearls'" (qtd. in Daston 2004, 115, fig. 10).

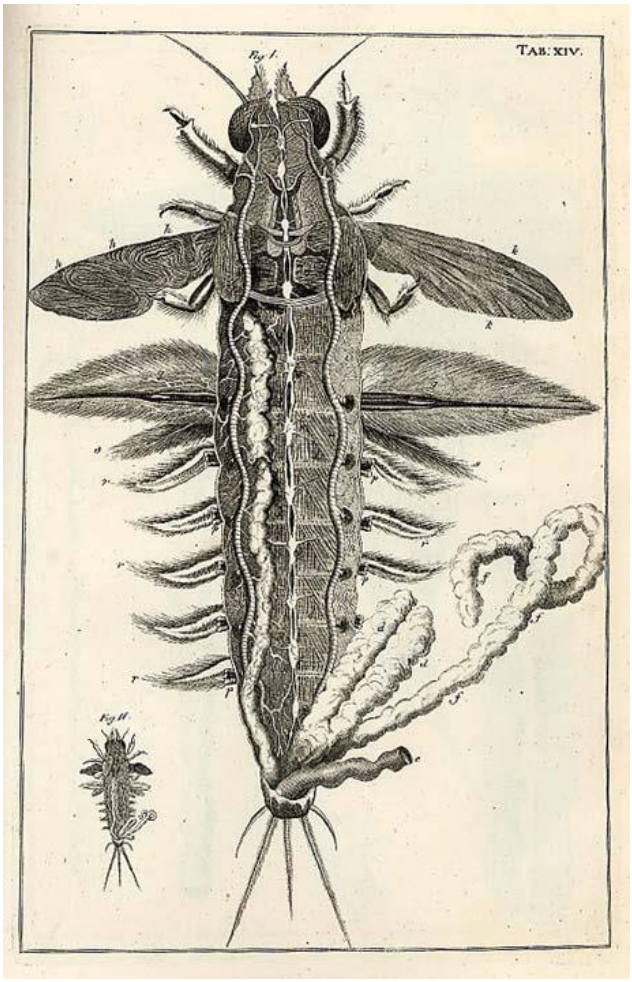

Figure 10: Dissected caterpillar illustrated by Jan Swammerdam, 1758.

Beyond any advances in entomology, Swammerdam's obsessiveness has been immortalized in the philosophy of science. In Max Weber's presentation of "disenchantment," the removal of mystery from European rationalism and science, Swammerdam serves as the exemplar of a lost form of enchanted science. Weber quotes the Dutch biologist, "I bring to you here the evidence of God's providence in the anatomy of a louse" (1946, 142). Insects, in their

intricacy and mystery, served to demonstrate the enchantment of the world that could be illuminated, not banished, through empirical science.

The study of the wonders of nature contained even in the smallest insects exemplified the romantic inclinations of Enlightenment science (Raffles 2011, 123–40). However, all the minute inspection of insects never seemed to reduce their deeper mysteries. Eventually, the study of insects moved away from demonstrating a divine order to disrupting order itself. As Hugh Raffles explains, "The difference of insects – so small, so alien in appearance, so prodigious in their reproductive capacities – was profound and troubling. It placed them as simultaneously natural, that is, unexceptional and God-given, *and* on the borders of the inexplicable" (2011, 126, emphasis original). Insects offered a fascinating lure for science to move from studying of a divinely ordered world to the limits of that ordered cosmos.

The romanticism of this Enlightenment science of wonderous creatures contains a darker side as well. In the pursuit of more and more samples of previously unknown curiosities, natural scientists were frequently among the initial waves of European colonialism along with merchants and missionaries (Greenblatt 1992). Searching for "exotic" samples of plants and animals, as well as stories of Indigenous peoples, these scientists were instrumental in driving colonial expansions further in from coasts (Pratt 2007, 23). In part, this push resulted from the popularization of Linnaean taxonomy. As natural science divorced itself from natural theology and posited a global order for all species, scientists felt drawn to gather as many samples as possible to expand the taxonomic table. Materially, this project gave a scientific impetus to greater colonial expansion, particularly into the lush rainforests and vast biodiversity of South America (Pratt 2007, 25).

The colonization of South American land and peoples thus went hand-in-hand with the attempts to scientifically master animals like mosquitos, both materially and conceptually. Making colonized land amenable to imperial government required strong efforts to "tame" the land as well as the people (Ybarra 2012). One could say that the process of colonization had colonized entomology. No longer reveling in the limits of knowledge at the edge of divine mystery, entomology became an epistemic and practical tool of imperialism. As Europeans moved further and further into the continent, understanding and controlling mosquitos become a practical and significant act of colonial space-making (Mitchell 2002).

Yet despite efforts to "domesticate" mosquitos and remove their threat, the insects have stubbornly remained the "villains" of state public health endeavors (Lopes and Reis-Castro 2019). Mosquito control has been one of the largest and most dramatic environmental health projects taken on by a number of Latin American states, ranging from efforts to destroy their breeding grounds during the creation of the Panama Canal (Carse 2014), community search-and-destroy missions in Nicaragua (Nading 2012), to the gruesome *dedetização*[28] raids that continue across Brazil (fig. 11). Despite these efforts, mosquitos continue to kill hundreds of thousands of human beings every year through a variety of diseases,

Figure 11: *Dedetização* (Reardon 2019)

[28] *Dedetização* is a general Portuguese term for pest extermination. Etymologically, it comes from the acronym for dichlorodiphenyltrichloroethane (DDT). DDT remains one of the standard chemicals used for mosquito control despite widely known concerns about its effects on human and environmental health.

making them the animal most lethal to human beings (WHO 2019).

The persistent danger of mosquitos in Brazil returns the insects to their position at the threshold of domesticated creature and wild monster. “We’re never going to defeat the mosquito,” Luis told me before clarifying in the careful tone scientists frequently use when qualifying their statements: “We’re going to *control* the transmission to a point where we can avoid as many deaths as we can until we can develop vaccines.”

For their part, mosquitos have become much more adapted to human environments since their emergence in the Jurassic era. Many mosquito populations are now “liminal animals” (Donaldson and Kymlicka 2011) who are more adapted for urban or other anthropogenic ecosystems than any form of “pristine” wild. For example, mosquitos in Puerto Rico have been found adapting to breed in septic tanks, making them much more capable to spread into cities and residential areas (Barrera et al. 2008). Similar mosquito migrations have been noted in Brazil, as floods create breeding grounds in city streets. Further, as Luis explained to me, one of the unexpected consequences of the Mariana dam disaster had been the elimination of mosquito predators, resulting in a mosquito population boom and a subsequent spread of yellow fever in nearby areas.

Other arthropods like scorpions have also been increasingly urbanizing in Brazil as climate change and land-use destroys their previous ecosystems. With a lack of predators and plentiful food, scorpion populations have exploded in mega-cities like São Paulo and others in the south of the country, where temperatures are rising. Scorpion stings have nearly doubled in Brazil since 2014 (Alves 2019), leading to shortages of anti-venom at some hospitals (Phillips 2018b). While climate change makes much of life in Brazil more chaotic, it has counter-

intuitively led to a greater domestication of mosquitos and other animals as they literally move into human homes.

It is at the collision of these two worlds, human and mosquito, that Luis' research into "niche construction" acquires its significance. To acknowledge that mosquitos take an active role in modifying their ecosystems to suit their own interests radically undermines certain conceptual differentiations between the human and animal. For example, Heidegger understands human existence as "*Dasein,*" that being which is uniquely concerned with its own existence, and "world-forming" (Heidegger 1995, 285) He contrasts the human ability to be "world-forming" with animals, which are "world poor," or limited in their capacity to engage with their surroundings (Heidegger 1995, 198). This understanding of animal worldhood is derived from Jakob von Uexküll's concept of the *"umwelt* [life world]." For von Uexküll, an animal's *umwelt* is the composite of all that an animal can perceive ("*merwelt*") and all that an animal can alter ("*werkwelt*") (2010, 47). If an animal is limited in its capacity to alter the world, it is locked away into a circumscribed "world-poor" domain. Only *Dasein,* with its ability to create new worlds of meaning and objects, can be said to be spontaneously "world-forming." But if mosquitos are engaged in niche construction, acting not only on the existing beings in their surroundings but fundamentally creating the conditions for the emergence of bacterial and viral life, then the distinction between the human and the animal on the basis of world-formation blurs. If we may speculatively imagine the mosquito's perspective, it would appear as if the mosquito is "world-forming" and it is the human, scared of disease and pests, who is finding itself circumscribed and "world-poor." As Zakiyyah Iman Jackson remarks in a study of Octavia Butler, insects are one of the few non-human animals discussed as imperials in their own right with "colonies" (2020, 128). We might understand mosquito world-formation as a form of insect

imperialism. Mosquito worlds and existing human worlds are not entirely commensurable. If mosquitos thrive, others will suffer.[29]

How does one understand this antagonistic, otherworldly domain of mosquitos that has long threatened Brazil's human world-creation? Luis' research into the world-forming practices of mosquitos never attempted to integrate mosquito worlds into a human domain. His appreciation of the "opacity of not knowing," and of "having no clue" about how best to control mosquitos while knowing that they will never be "defeated" represents a one possible example of emetic science in practice.

In order to determine if mosquitos modified the microbiome of the water in which they laid their eggs, Luis devised an experiment where the lab would monitor the microbial ecosystem of water before and after being exposed to mosquitos. If the microbiome consistently changed after mosquito-contact, then Luis' hypothesis would be confirmed. This experimental set-up seemed simple enough. However, the lab quickly ran into a surprising practical challenge. How does one expose water to a mosquito? Luis did not know the exact mechanism that mosquitos may be using to modify the microbiome. Did mosquitos have microbial colonies on their skin that they passed on to the water? Did mosquito surfaces contain some kind of agent that selectively killed particular microorganisms? Were mosquitos secreting some kind of antibacterial substance? Without knowing the mechanism, the lab sought to simply submerge the mosquitos in water samples to determine if any changes occurred.

[29] Alex Nading (2012) has argued against the use of militaristic language to discuss mosquito control due to its tendency to overlook the "entanglement" of human and mosquito worlds. In discussing mosquitos as antagonists, I do not intend to make this reductionist claim. Rather, as I have demonstrated through my engagement with Viveiros de Castro and the Krenak, antagonism does not necessarily imply a schism.

However, much like water striding insects, mosquitos can sit on top of the surface tension of water. This limits their submersion in water in normal circumstances. Luis' team sought to work around this challenge by placing mosquitos in test tubes with water and swirling the tubes to douse the insect. This strategy ran into another problem. Mosquitos are coated in tiny hairs that contain a slight static charge. Water molecules are polar, meaning that the charged hairs on the mosquito repel water droplets (fig. 12). It has been hypothesized that mosquitos evolved this trait to resist rain drops, allowing them to continue flying in rainy weather (Dickerson et al. 2012). When placed into test tubes full of water, the mosquitos' hydrophobic hairs repelled the water around them. Somehow, almost comically, the lab was struggling to simply make mosquitos touch water.

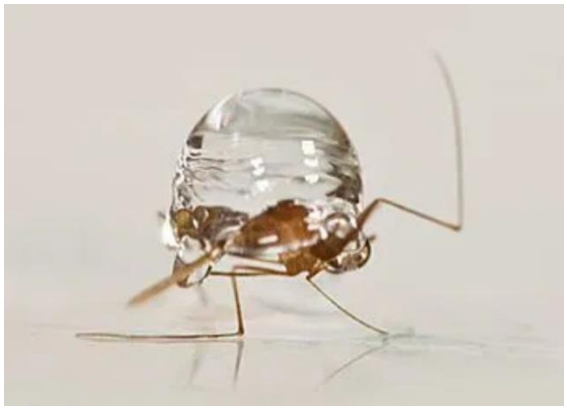

Figure 12: Mosquito repelling water (Dickerson et al. 2012).

This snag is one of the surprises experiments are designed to produce. In Hans-Jörg Rheinberger's analysis (1997) of "experimental systems," the material and conceptual arrangements of laboratory spaces, experimental unpredictability is the necessary condition for experiments to reveal new information. It is only because an experiment can be surprising that it is worth conducting (Rees 2016, 152). In addition, Roy Bhaskar (2008) compellingly argues that such experimental surprise would be meaningless if not for the presupposition of a real entity or event understood to be the source of the surprise.[30] In this sense, we can understand experiments

[30] Bhaskar's realism places him in contrast with more skeptical interpretations of experimentation such as the one offered by Tobias Rees, for whom realist interpretations of inquiry are understood to be teleologically oriented towards the creation of "an alternative ontology – to explain how the real is organized" (Rees 2016, 148). However, one can be a realist without proposing a systematic ontology. Building on Bhaskar's "critical realism," object-

as relying upon the same "opacity of not knowing" that characterizes relations of enmity. While Luis' experiment failed to "defeat" the mosquito, it works as "basic research" because mosquito worlds are not entirely commensurable with human worlds.

But what is the learned through the experimental surprise of failing to get mosquitos wet? Explaining in greater detail the laboratory's challenges with immersing mosquitos in water, Luis recounted how, in an act of experimental desperation, they simply took mosquitos, stuffed them into test tubes, and swirled them with water. "It's like a forcefield," Luis told me, circling his hands to create a sphere, "They form a bubble around themselves and they don't touch the water at all." Even within the *in vitro* setting of the test-tube, the messy *in vivo* of the mosquito continues to assert itself.[31] It is telling that the only language available to Luis to discuss this surprise is not the sterile rhetoric of technical reports, but the fantastical language of "force fields," harkening to the science fiction staple of energy barriers, or perhaps to James Frazer's "sympathetic magic" and mysterious "action at a distance" (1959, 14).

Breaking through the long history of colonial efforts to tame the land, technical efforts to eradicate their species, and experimental systems seeking to constrain them, the mosquito stubbornly holds on to its ability to surprise. Through his use of speculative rhetoric, Luis signals that the mosquito has held on to this wild and uncontrollable position,[32] escaping the constraints

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oriented ontologists like Levi Bryant have argued that the "real" that is revealed through experimentation is not a systematic ordering of a monolithic ontotheology, but rather the uncontainable strangeness of an alien world that exists independently of observation or rhetorical construction (Bryant 2011, 50). Following this lead, I approach Luis' experiments as an interaction with actually existing entities but not as a dogmatic articulation of a general world order. As Bhaskar himself explains, "To be a fallibilist about knowledge, it is necessary to be a realist about things. Conversely, to be a skeptic about things is to be a dogmatist about knowledge" (Bhaskar 2008, 43). It is through encounters with others that our sense of certainty is shattered and inquiry emerges, not through a pre-given commitment to the incompleteness of knowledge.

[31] For more discussion of the difficult and incomplete translations between the *in vitro* and the *in vivo*, see (Coren 2020).

[32] In calling mosquitoes "wild," I refer to Radhika Govindrajan's concept of the "otherwild:"

> […] A space that is not entirely contained by the logics of rule and domination, whether by some humans over other humans or by some humans over nature. […] A world of tentative and difficult fellowship, relatedness, and exchange; a world where animals are not always and already imbricated in human projects

of territorial domination and scientific mastery. The experimental surprise does not arrive at greater control of mosquitoes or viruses, but rather at a greater appreciation of just how alien these creatures remain.

Luis' experiments demonstrate the potential of an emetic inquiry. The failure to completely domesticate mosquitoes is not a problem that must be overcome. Rather, it is by appreciating that the experimental systems are limited that lessons about mosquitos emerge. Emetic inquiry may appear disappointing in certain respects. Certainly, Luis' laboratory was frustrated by their inability to conduct the experiments that they had planned. Giving up on the idea that inquiry can reliably answer the questions it investigates requires a degree of humility. However, the humility of emetic inquiry does not imply that inquiry is worthless. It is precisely through the recognition of our limits in grasping the totality of other beings that we may learn to better live within the climate crisis.

Conclusion

On classical world maps, unknown regions were marked with dragons and other monsters to indicate danger. They marked the limits beyond experience where only mystery and imagination held sway. Today, there are real monsters on the earth, already on our maps (Dixon 2016, 116). Besides the dangers they pose, these monsters continue to play their historical role of "straddle[ing] boundaries" (Park and Daston 1981, 25), disrupting the supposed stability of our approaches to science and politics. Facing the climate crisis in a just fashion will mean

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> but come to interspecies relationship as beings whose histories, though linked to humans, are not exhaustively contained by them; a world where logics of domination and violence are remade in unfamiliar and potentially radical ways even as they are reinscribed. (2018, 123)

Govindrajan's analysis of feral pigs demonstrates the inherent limits of colonizing projects, unable to ever completely eradicate traces of these uncontrollable and wild spaces.

acknowledging these relationships of exteriority, whether in the form of alien mosquitos or colonial violence.

Like G.H.'s cockroach, efforts to erase these exclusions through ingestion into a coherent whole may not be palatable. This does not mean that we ought to crush as many cockroaches as we can find. As I have shown in this chapter, the relationship of enmity is ambivalent. Warfare and elimination are not the only responses to enmity. Instead, I propose approaching enmity as a signal of irreducible differentiation. Rather than posing the limit to democratic politics or scientific research, a respect for limits and enmity can instead act as the basis for a form of emetic inquiry that does not seek to colonially totalize all experience. Through an openness to conflict and its attendant fear, confusion, and opacity, anthropology and might find a strategy that adequately faces the monstrosity of the climate crisis.

CHAPTER 4: ANTI-FUNCTIONAL GOVERNANCE
Minor Blockages in Environmental Bureaucracies

The problem of tragic literature and philosophy is what status should be given to the four horsemen of the Apocalypse. Are they those extravagant and dark heroes who await the end of the world to burst forth? In what form do they suddenly appear, with what countenance? The plague, the great massacres of war, a famine? Or might they be four little worms that we all have in our brains, deep inside our heads, at the bottom of our hearts?
Michel Foucault, "The Four Horsemen of the Apocalypse and the Everyday Worms"

"Everybody is talking about climate change, so you have to talk about it too. I think that's why I don't find resistance to talking about climate change in the government. Maybe there is more resistance to talking about climate change in FEAM [the State Foundation for the Environment]." Maria's complaint surprised me. If there was so little resistance to talking about climate change in the government, why would FEAM, the state agency most directly tasked with climate governance, be the least able to talk about it? I had not expected that the toughest resistance to addressing climate change would come from within the Secretary of the Environment. Instead, I expected science skepticism and climate denial to be the key challenges to climate governance, but time and again my Mineiro interlocutors had other explanations for why climate action was hindered or delayed.[33]

By the time Maria expressed her frustration to me, I was already many months into my fieldwork. I had not seen any open opposition to talking about climate change, but a persistent feeling of frustration hung over daily work. There was often an unsatisfied desire to have a greater impact, to make stronger proposals, to engage more partners, or to simply do *more*. Over

[33] Broadly speaking, the climate analysts I spoke to felt that the public and the government accepted the reality of climate change. Even Michel Temer, the right-wing, neoliberal interim president strongly aligned with agriculturalists, signed the Paris Climate Agreement and announced: "We know that climate change is a real problem and that we have to confront it systematically and vigorously" (2017).

the course of my fieldwork, numerous promising initiatives were derailed, stalled, or diverted. Climate analysts frequently found themselves deprived of resources like time, money, or energy.

Maria's assessment of FEAM's unwillingness to address climate change aligned with outside evaluations of Brazil's environmental bureaucracies. For many, the failure of the Brazilian state to meaningfully engage in environmental politics stems from structural failures within state institutions. For instance, the Brazilian political scientists Eduardo Viola and Matías Franchini conclude their account of Brazil's environmental "underperformance" with a list of reasons, including doubts about the thoroughness of Brazil's democratization and economic policy. Among the proposed causes of Brazil's lack of environmental action is the expansive bureaucracy, which the authors describe as:

> hypertrophied […] fragmented, compartmentalized, corrupt, and inefficient, in which the major criteria for selecting senior-ranking officials are not meritocratic, but political, that is, posts are distributed according to the power of the various political factions at the time. Still in the bureaucratic class, the majority of public servants use their position to advance their own interests, instead of the public interest. (Viola and Franchini 2017, 195)

Viola and Franchini find fault with the conduct and character of bureaucrats. They join a global discourse that perceives bureaucracy as intrinsically deadening and inimical to 'genuine' politics, understood as a public contestation of collective futures (Weber 1978; Herzfeld 1993; Gupta 2012; Hetherington 2011, 7).

Bureaucracy's inefficiency makes it an easy target for popular critiques of government mismanagement. Visiting bars after work, I encountered these anti-bureaucratic sentiments frequently, even when speaking to people with no connection to the government. A common immediate reaction to mentioning I worked with the state government was "How's the corruption?" or "I hope you get the bastards!" Politician's promises to shrink the state institutions were easily celebrated, whether they came from conservative neoliberals like Michel

Temer or populist authoritarians like Jair Bolsonaro. Bureaucracy's appearance as inefficient or incompetent made state employees like Maria easy scapegoats. It was not a good time to be a bureaucrat.

Despite people's impressions that all state bureaucrats were corrupt and therefore did not care about effecting change, Maria and other bureaucrats I met at FEAM seemed to appreciate the dangers of climate change and to genuinely want to do something to mitigate those dangers. However, somewhere along the line between motivations and action, state climate politics ran aground. María often critiqued state institutions like FEAM by contrasting her own earnest desire to do something more than what the bureaucracy permitted. The desire for environmental action seemed to be shared by the rest of the climate analysts at FEAM. They seemed to partially agree with the critique of bureaucracy shared by academics like Viola and Franchini and the broader public. To climate analysts, the bureaucracy imposes limits, but they disagreed with the contention that those limits are the direct result of personal failings among the staff.

Where had things gone wrong? How could the desire for environmental action fail so consistently that the environmental ministry itself seemed to be the primary culprit? In this chapter, I will investigate some of the bureaucratic practices that block effective climate actions. As will become apparent, these practices rarely openly interfere with environmental governance, but rather occur through "minor vices:" "micropractices that block ethical and veridictional pursuits without refuting or directly challenging them" (Rabinow and Stavrianakis 2016, 413). Calling these vices, such as small delays or mild incompetence, "minor" is meant to evoke a sense of their apparent triviality. It can often be easy to overlook a minor vice or to excuse it as accidental or inconsequential.

Minor vices contrast with "major" events like the disasters discussed in Chapter 1 that spectacularly destroy the environment or starkly make it more difficult to address the climate crisis. To draw on the passage from Michel Foucault (1999b) in the epigraph of this chapter, minor vices are not the horsemen of the apocalypse "extravagantly" riding into battle, but the small, insidious worms eating away from the inside. Appreciating both poles of this spectrum ranging from catastrophic disasters to minor bureaucratic maneuvering is necessary for understanding the challenges of the climate crisis.

Minor vices, while not seeming significant or particularly harmful on their own, can lead to similarly minor "blockages," situations that inhibit the function of a project or institution. For example, a small delay due to someone running late might result in a meeting being postponed until after a vital deadline. While that person's tardiness could have been an accident, the hindrance it creates can be significant. Through the accumulation of many of these banal minor vices and blockages, an institution may be brought to a standstill, all while remaining unclear of *who* precisely produced the deadlock. Within the environmental bureaucracies,

The danger of minor blockages is that they typically seem "reasonable" or "normal" and therefore escape official notice. Within the Mineiro environmental bureaucracies, analysts spoke about minor blockages through gossip, whispers, or suspicions (never allegations!) of conspiracy. Whether or not blockages are intentional is unavoidably ambiguous and can never be proven. From outside the institutions, it might appear as if everyone is equally at fault for the dysfunction of the government. In the examples that follow, the inability to pin culpability for minor blockages on any one person or office becomes part of what Taussig called "epistemic murk" (1987, 121), an ambiguous space created by colonial governance where nothing is certain, resulting only in further confusion, suspicion, and derailment.

To be clear, Taussig's historical and ethnographic work on the Putumayo rubber boom substantially engages with more catastrophic forms of horror than bureaucratic malaise. However, his concept of "epistemic murk" specifically engages with the workings of statecraft. As he explains:

> The importance of this colonial work of fabulation extends beyond the nightmarish quality of its contents. Its truly crucial feature lies in the way it creates an uncertain reality out of fiction, giving shape and voice to the formless form of the reality in which an unstable interplay of truth and illusion becomes a phantasmic social force. […] What distinguishes cultures of terror is that the epistemological, ontological, and otherwise philosophical problem of representation – reality and illusion, certainty and doubt – becomes infinitely more than a 'merely' philosophical problem of epistemology, hermeneutics, and deconstruction. It becomes a high-powered medium of domination. (1987, 121)

In other words, state power operates through more than blunt force. It also operates through the production of uncertainty about power itself, which it masks or reveals at different moments. Achille Mbembe (2001) makes a similar argument in the African context through his examination of the "vulgarity" of postcolonial rule as a vestige of the lack of a need for the legitimate consent of the governed population. Without a demand that state power be clearly justified, the (post)colonial state uses a series of aesthetic strategies, such as grand theatrical displays of power, that mask or distort its operations (Mbembe 2001, 109).

By treating bureaucracy as an instance of "epistemic murk," I am not equating a relatively comfortable work place of bureaucratic institutions with the horrors of torture, executions, or other forms of violence that concerned Taussig and Mbembe. Rather, I am arguing that the production of minor blockages in the state institutions is part of the broader operation of postcolonial state power. If anthropologists, activists, or bureaucrats themselves would like to engage more fruitfully with the state, it is vital that we better understand these various strategies for rending the state inoperable.

Case 1: Accessing the State

Figure 13: *Praça da Liberdade* in 1934 from the Acervo Museu Histórico Abílio Barreto.

Blockages and murk emerged the moment I attempted to enter the state bureaucracy. In many ways, the capital buildings seemed to have been designed to prevent public engagement with the government. When the original plans for Belo Horizonte were drafted in the 1890s, the government was located in a series of European style palaces and halls surrounding a well-manicured public park, *Praça da Liberdade* (fig. 13). The *Praça da Liberdade* remains a central location in downtown Belo Horizonte with many of the city's primary streets radiating out from its edges. Over the years, some of the mansions have been replaced by exemplars of Brazilian architecture, including the *Edifício Niemeyer*, designed by and named for the famed Mineiro architect Oscar Niemeyer in 1955. At the end of the central axis of the *Praça da Liberdade* sits the Governor's mansion. The centrality of the park and its proximity to the state government buildings made the *Praça da Liberdade* the ideal location for public demonstrations that would be easily visible to the bureaucrats in their offices surrounding the park. In this sense, the park served as a modernist *agora*.

This arrangement was relatively short lived. In 2007, under the banner of "modernization," the state government approved the construction of a new administrative centre (fig. 14), the *Cidade Administrativa*, on the site of a horse-racing track to the north of the city center. Reaching this new government centre from the old one currently takes approximately 30 minutes by car, four hours of walking, or, as I did for almost every day of my fieldwork, an hour-long bus ride.

Figure 14: Presenting the planned *Cidade Administrativa* to its architect Oscar Neimeyer (second from the right) inside one of the old government buildings surrounding the *Praça da Liberdade.* (Muratori 2020)

Figure 15: The *Cidade Administrativa* (Milena 2018)

Cut off by mountains to the West and half a dozen lanes of highway to the East, the *Cidade Administrativa* (fig. 15) rarely receives uninvited visitors. However, images of the high-modernist design of the gently curving tinted glass windows encasing the administrative offices or the improbably suspended new Governor's mansion[34] are emblazoned on many of the public buses in the city. Anyone driving from central Belo Horizonte to its primary airport goes directly past the *Cidade*, although finding the off-ramp to actually enter it requires some prior knowledge.

[34] While the *Cidade Administrativa* includes a Governor's mansion, every Mineiro governor since its construction has opted to remain in the traditional Governor's mansion at the *Praça da Liberdade*, making it the only one of the old government buildings still fulfilling its original purpose.

Access to the buildings in the *Cidade* is strictly controlled by security guards at the entrance to each of the four main buildings. Gaining my own key card as a *presitador de serviço* gave me the ability to freely enter and leave my office space without needing to call a supervisor for assistance. Due to a clerical error, my card was issued to "Jonathan Garrett," confusing my middle name with my last name. When I tried to correct the misunderstanding, my objection was waived aside. "Don't worry about it, it won't matter," I was told. My travel visa had been issued to "Jonathan Garrett Wald," a United States Citizen. My *Cadastro de Pessoas Físicas* number, the Brazilian equivalent of a social insurance number, had been issued to "Jonathan Wald," who was mistakenly identified as a Canadian citizen due to my listed mailing address. My key card was yet another version of me. Writing about conducting fieldwork in Romania under Ceausescu's rule, Katherine Verdery (2018) notes that bureaucracies can create multiple identities or versions of selves documented in archives. In a system where paperwork tracks the movement of an individual, "Jonathan Wald," "Jonathan Garrett," and "Jonathan Garrett Wald" held an ambiguous relationship to each other.

Resolving this inconsistency would have meant leaving Brazil, refiling my immigration paperwork, waiting months, and risking being rejected, all due to what were technically small infraction committed when I mistook the Portuguese word "*sobrenome*" to mean "family name," rather than, as it actually implies, all names which are not "first names." I had filled out forms with "Wald" as my "*sobrenome"* and "Jonathan Garrett Wald" as my full name. This misunderstanding, seemingly minor, meant that I was always vulnerable to having my immigration paperwork voided at any time. This minor blockage could have derailed my research at any moment.

Case 2: *Bureaucratic Aesthetics*

Every day, the government of Minas Gerais publishes an official, exhaustive record of the day's events. This publication, the *Diário Oficial do Minas Gerais*, includes every executive order, every law passed, every memo sent, every person hired, and so on. Anything that officially happens within the state is published in the following day's *Diário Oficial.* In many ways, this document appears to be a great achievement in government transparency. Everything is laid out in the open for all to see on the government's website.

However, there is a catch. As Kregg Hetherington notes in his analysis of the discourse of "transparency" in Latin America, the impulse to publish *everything* can actually render government work more, not less, opaque. There is simply too much information presented that it quickly becomes overwhelming. My first experience with the *Diário Oficial* clarified this lesson for me. I had been told by a climate analyst that the legislature had officially changed GEMUC's directives. This happened with surprising frequency. I never noticed any substantial change in GEMUC's day-to-day activities as a result, but the team's official description frequently changed without consultation with the analysts, always resulting in a search through the *Diário Oficial* to study the new guidelines.

To find something in the journal, one first goes to its website and then selects the date of the appropriate issue. From that point on, each page is loaded individually in a new browser window (fig. 4). Most of the text is written in strings of numerical codes referring back to previous editions, laws, or orders. My efforts to understand the pages on my screen seemed futile. Despite being a text written in a language I ostensibly could read, I felt like this was a text that was not meant to be understood. The font was tiny. I was reminded of the one time I attended a Catholic service and heard the priest speaking in Latin. This led me to wonder: is

communication the only intention of these documents? What else does the *Diário Oficial* accomplish besides communicating the content of its text?

In *The Network Inside Out* (2000), Annelise Riles proposes observing bureaucracy as an "aesthetic" entity, that is, as a system which produces effects through appearances rather than (only) formal actions. Similarly, Hetherington's approach to Paraguayan transparency treats official documents as significant beyond their referential and linguistic elements. Drawing on these approaches, one could study a document like the *Diário Oficial* like an artwork, asking what happens when one looks at it without rushing to understand its "true" meaning.

Consider a page from the *Diário Oficial* (fig. 16). The small font, inlaid amidst an expansive gray background, does not immediately lead to a "transparent" understanding of the inner workings of the state bureaucracy. Different column sizes, fonts, and borders all seem to signify *something*, but it is not clear what. Zooming in on any point did not help unless the reader was already familiar with the long strings of numbers which referred to past issues of the *Diário Oficial.* Turning the page on the document was slow as each page is a separate file, thus requiring a few seconds to load. The *Diário Oficial* presents a metaphorical "wall of text" that serves a similar function as the real walls of the *Cidade Administrativa*. It keeps out those who are not already familiar with how to enter into conversation with the state.

These are all petty complaints about this effort to provide transparency, but that is the point of minor blockages. Small font sizes and slow loading times will never grab headlines like a multi-million *real* embezzlement scandal, and yet these minor inconveniences undermine efforts to address corruption and enact climate governance.

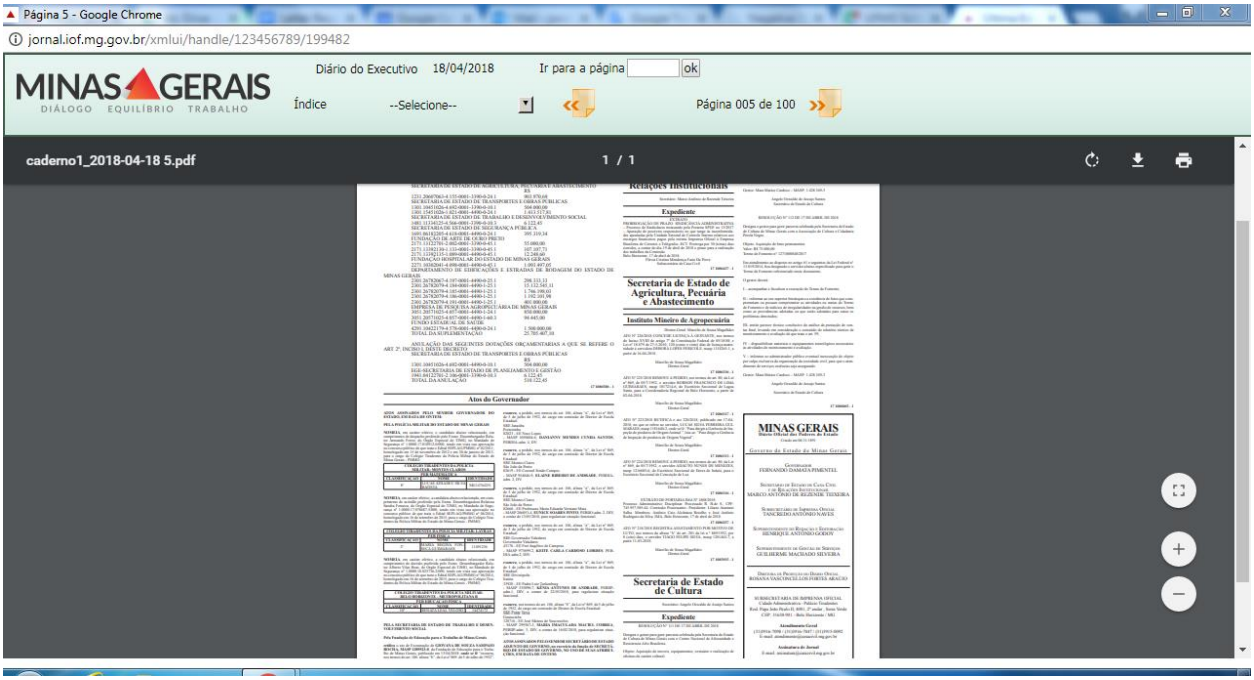

Figure 16: A page from the *Diário Oficial do Minas Gerais* as it appears in a browser.

Case 3: *An Anti-Corruption Crusade*

Most of GEMUCs workers had not worked there for very long. A handful worked in other sections of the Minas Gerais government before transferring, but many were hired directly from university after receiving a degree in environmental science, physical geography, or a related field. In order to receive a position in the bureaucracy, candidates from the universities must enter a lengthy competition period where the final hiring decisions were typically made by the head of GEMUC. In recent years however, economic austerity trickled into the state government. It became harder to replace retiring workers, and the monthly salary was parceled out into smaller bimonthly portions. The result of these restrictions was an atrophy of FEAM's workforce.

Trying to hire new staff revealed unexpected difficulties. In 2017, GEMUC attempted to recruit a junior researcher from a public university. Working through a program established by

the state research agency, the *Fundação de Amparo à Pesquisa do Estado de Minas Gerais* (FAPEMIG), to provide opportunities for qualified graduate students to assist government agencies, GEMUC received hundreds of applications for the position, many already with relevant technical training and certifications. By evaluating *curriculum vitaes*, GEMUC narrowed down the field to about a dozen applicants before making their final decisions in December. At this point, however, they were told by their superiors that hiring a graduate would be forbidden. A law passed earlier that year created stricter provisions for partnerships between the government and civil society with the objective of preventing corruption. The legislature feared that FAPEMIG's recruitment program could be used as a pipeline for nepotistic or otherwise corrupt hires. Members of the Minas Gerais government felt that the partnership between the universities and the government violated the new law and would therefore be eliminated. At the last minute, the program that GEMUC would have used to acquire a new intern ceased to exist.

Numerous questions circulated. Among them: was the partnership with the universities really corrupt? Was the timing of the news specifically intended to disrupt GEMUC and climate politics? It is hard to say. While it is possible that a well-connected individual may have been able to use the program to secure employment for their child or friend, it seemed unlikely that the corruption of this program might equal the high-profile corruption cases that have plagued Brazil for decades. As a policy that affects the entire government, there may have been another target. Some of the people I spoke with wondered if there even was a tangible objective. One doubted that the government even knew the consequences of their actions. Amidst widespread concern in Brazil over the corruption revealed by the *Lava Jato* investigations, the new restrictions may simply have been a strategy to appear righteous in public view without making a possibly more

significant change to the government. Some analysts liked to call these machinations "Machiavellianism."

Throughout Brazil's anti-corruption movement, there have been frequent allegations that charges filed against particular individuals or programs have been means of eliminating political opponents without an election or open dialogue. At the presidential level, it is interesting to note that the Worker's Party won by comfortable margins in four of the last six presidential elections, and that Dilma Rousseff and Lula da Silva, its last president and her predecessor, had both been removed from institutional politics through corruption charges. Some might think that the corruption charges against them were merely a means to the end of having them removed from office when democratic elections were failing to produce results. In addition, many of the remaining politicians were suspected of being corrupt as well. Why were they not investigated? Doubts surrounding the motivations behind some of the corruption allegations, as well as the evident corruption of some of the remaining politicians, led many to question the authenticity of Brazil's emergent "tough on crime" approach to corruption.

Whether or not the charges are true, the allegation that the legislature was guided by "Machiavellianism" led me to approach the corruption investigations with a different set of questions. Why would the legislature accuse the university partnership of corruption? This may have been an effort by the elected officials of Minas Gerais to divert attention away from themselves and dodge the wave of anti-corruption investigations. But in order to dodge, they had to find a suitable target for public anger. By successfully accusing another group, an accuser can appear righteous at first glance.

The cloud of corruption and anti-corruption persistently hung over work at FEAM. Suspicions of impropriety mixed with fears of exposés produced an atmosphere where trust was

difficult to win. Interviewees would frequently glance over their shoulder while speaking to me, even if the topic was apparently innocuous. Many simply refused to speak with me, worried that, as an outsider, I might have been there to uncover corruption. Reassuring interviewees that this was not my goal became a key element of my efforts to build rapport within FEAM.

Case 4: Halting Collaboration

Since 2007, GEMUC maintained formal relationships with agencies in the French *département* (region) of Haut-de-France (formerly Nord-Pas-de-Calais) and the *Agence française de développement* (AFD). Initially part of a broader agreement between the French region of Nord-Pas-de Calais and Minas Gerais based on shared histories of mining, workers at GEMUC had established connections with French environmental agencies that continued, on and off, for many years. Support from these foreign partners was instrumental in providing GEMUC with the resources and political capital necessary to make climate change a state priority. The AFD also provided technical assistance to GEMUC in drafting its *Plano de Energia e Mudanças Climáticas*, which is currently Minas Gerais' primary document outlining its position on climate change.

Relying on global and foreign entities allowed FEAM to sidestep resistance from local and Brazilian national organizations. The strategy gave FEAM access to technical and material resources and allowed them to advance their position within the Minas Gerais government via prestigious collaborations with foreign organizations. However, it also made FEAM vulnerable to shifts and disruptions occurring abroad. In 2014, France began a process of territorial reform in order to reduce public expenditure. This process meant merging 16 regions into seven, including a merger between Nord-Pas-de-Calais and Picardy. Normally, a reorganization of the

administrative map of a country would be a relatively domestic affair, but for FEAM, the 2016 implementation of the plan meant the disappearance of their collaborator.

Throughout 2017, FEAM attempted to reinitiate an agreement with Nord-Pas-de-Calais' new region, Haut-de-France. Although the national election of Emmanuel Macron in 2017 was internationally greeted as a victory for France's environmental reputation, elections in the regional *départements*, including the new Haut-de-France, had resulted in more conservative parties taking power.

Amidst the confusion of the restructuring and ambivalence towards climate politics in France, GEMUC struggled to restart its relationship with Haut-de-France. Weeks went by with no response until an unexpected email arrived from France in late January, 2018. A meeting between GEMUC and representatives of Haut-De-France was quickly called to discuss new terms. Originally, the goal of the meeting was to simply return to the past agreement, updated slightly to reflect the progress of their work. However, the representatives from Haut-De-France presented GEMUC with an ultimatum: with the Brazilian election approaching in October, they could either sign a placeholder agreement now that could be amended and specified later, or wait until 2019 to see how their situation appeared after the election. For GEMUC, the decision was straightforward. It would be better to sign a vague agreement that could be elaborated later than to wait for another year in the hopes that the offer still stood. Between the uncertainties of two nation's political situations, it would be more secure to have an agreement in place as soon as possible.

Unfortunately, the procedure for signing a memorandum required that GEMUC attain the approval of a cabinet chief. Waiting for upper management's response was a tense yet uneventful process. The analysts involved in the exchange would sit at their computers making minor edits

to the proposal and exchanging emails hoping to gain a little more insight with little success. Communication with the French agencies dried up as the agreement remained unsigned. A feeling of resignation started to overtake the GEMUC office. When news finally arrived, it was only of further delays. Rather than approve or reject the agreement, the cabinet chief chose to wait on making a decision, arguing that they "needed time to think" and that they should not rush into a contract. The reason for the delay could seem reasonable to some, but its timing was suspect. In accordance with federal anti-corruption laws, Brazilian government agencies are not allowed to transfer funds or form international agreements in the six months leading up to an election without an authorized document attesting to the rectitude of the agreement. Attaining one of these documents requires the assistance of another office within the government, introducing its own set of logistical hurdles. By delaying in making a decision, the cabinet chief made it unlikely that they would be able to enter into the agreement at all as they moved closer to the six-month deadline in April, beyond which agreement would require this higher degree of paperwork.

A pause for thought is hardly a grand crime, but in this circumstance, the delay may have scuttled all hope of continuing a productive relationship. Given the strength of Nord-Pas-de-Calais' prior support of Minas Gerais' approach to climate change, eliminating the connection between the two regions could have long term environmental impacts. All this damage was done not through open confrontation, but by simply taking a moment to think. What could GEMUC say? How can one critique an official for valuing prudence?

Given the challenges, the announcement in the final days of March, after over a year of negotiations, that FEAM and the AFD would begin a new collaboration addressing climate change was unexpected but welcomed by members of GEMUC. Despite the delays, the

connection between France and Minas Gerais had not been severed. Although the delay did not actually cause lasting damage to FEAM's relationship with French government agencies, the resulting demoralization took a personal toll on members of GEMUC, leading some to even consider quitting their jobs. The ultimate survival of the link does not erase or undo the uncertainty and frustration caused by the cabinet chief's decision.

The delay of the agreement is a clear example of the power of minor vices. Authorities within FEAM never clearly rejected collaborations with France, but by keeping their resistance constrained to a mere pause, they were able to halt progress while minimizing their own vulnerability to critique. Not only do the analysts and technicians lack the authority to rebuke their superiors, but they would appear petty if they were to challenge the decision to wait. If GEMUC ultimately fails to meaningfully address climate change, the fault will *appear* to be only their own.

Case 5: [redacted]

[redacted]His title seemed to be different every time I heard him mentioned. Was this because [redacted] kept moving up through the hierarchy? Had others forgotten his real title? Maybe his title did not really mater. All that mattered was that [redacted] was the authority. [redacted]

[redacted] He turned to me and shrugged. "Political indications" was all the explanation I would get.[35]

Conclusion

Why do problems in the bureaucratic process arise? Given how small or minor each of the practices of delaying or obscuring described in the above case studies appears, it could be that many of these delays and setbacks were unintentional. Alternatively, these cases might be seen as evidence of a deliberate effort to block environmental governance through subtle but

[35] Due to the desire for privacy and anonymity by many inside the government, as well as the lack of consent to participate in a formal interview, many of my interactions with members of the state government cannot be reproduced in this writing. By including an intentionally redacted portion of the chapter, I hope to convey to the reader a degree of the maneuvering necessary to conduct ethnography within these circumstances.

persistent interference. Were this chapter a legal proceeding, the case would be difficult to prove. Deniability is all too plausible given the minor scale of the blockages, which can each be explained away as small mistakes, misunderstandings or otherwise unrelated difficulties.

The hostile atmosphere produced by these practices and the public perception of them as potentially intentional does not necessarily spell the end of environmental politics, but there can be no doubt that they have deleterious effects. Many of GEMUC's analysts described fatigue and frustration, as one could expect given the circumstances of constant uncertainty and suspicion. Managing these stresses takes time and energy, distracting analysts from their roles as regulators and preventing them from dedicating their attention to developing new strategies to combat climate change. It would be impossible to quantify the hours of time lost to these minor blockages. However, the loss was surely substantial. GEMUC loses in the immediate sense, by failing to acquire a new intern, for example, as well as in the long term, as frustration causes some to consider leaving the government altogether. For some, the feeling that their job is only a day away from being eliminated makes them feel that their work is futile.

Such pessimism is particularly stark when considered in light of FEAM's history. What began as an optimistic project to accomplish the rational progress of technologically advanced economic development has since become an institution that seems almost designed to not function. The abundance of minor blockages gave rise to suspicions of "Machiavellianism," that the system was perhaps intentionally designed to be an "anti-functional" bureaucracy, one that seems destined to simply tread water. Perhaps things are not as dire as the "bullshit jobs" described by David Graeber (2013) wherein a host of useless positions are created merely to keep people employed, but the image is worth remembering. In the case of FEAM, the intention

may be to create the appearance of having an environmental protection agency within the government without actually engaging in the difficult process of engaging with climate change.

Thinking of bureaucracy as potentially anti-functional, or inefficient by design, provides a new perspective on the critiques of the bureaucracy as alienated from political action. While it may be true that many bureaucracies are largely inefficient or incompetent, this may not be due to the personal shortcomings of bureaucrats as many critics, like Viola and Franchini, seem to believe. Instead, the presence of minor blockages provides an alternative set of questions for understanding bureaucratic dysfunction. Are the failures of FEAM the fault of individual vices? Or has the system been constructed in such a way that the low to mid-level bureaucrats who work in the environmental ministries are doomed to fail? In the terms of conspiracy theories and detective stories (Hetherington 2020), are they being set up? We may never know, but the doubt itself is significant.

Bureaucracies are not institutions guided inevitably towards the accomplishment of their stated ends. Rather than presuming it is the rationalism and functionalism of bureaucracy that sets it apart from agonistic politics, as the Weberian tradition would do, it may make more sense to treat these institutions as profoundly absurdist in their irrationality and anti-functionality. In his historical analysis of bureaucracy, Giorgio Agamben (2013) traces the idea of an "office" to early Christian monasteries, as something that is filled by an individual but independent from their personhood. If we take Church institutions as the original bureaucracies then the place of "reason" in bureaucracy can be inverted.

As Michel Foucault notes, monastic rules were often presented as a form of absurdism: "Even deprived of significance, an order must be exhaustively obeyed: Like Father John, hero of obedience, when his master sent him to water a withered stick planted in the middle of the desert

for a whole year" (2018, 123). The original function of bureaucratic rules was not to maximize rationality, but rather to prepare the faithful to be wholly responsive to the influence of divine grace. Bureaucracy was meant to remove the need for individual rationality. This religious origin of bureaucracy was particularly marked in Latin America where the Catholic Inquisition was foundational in the history of colonial states (Silverblatt 2004). The antagonism between the meaningless dictates of bureaucracy and structured reason persisted through the formulation of the word "bureaucracy" in 1764, when the French journalist Melchior von Grimm described the new French government as consumed by "bureaumania." The newly bureaucratic government was deemed "the mortal enemy of reason and, without question, an aberration of the mind" (Felten and Oertzen 2020, 1). In other words, bureaucracy may not be the pinnacle of rationalism in action, as Weber may have believed. Instead, bureaucracy can be understood as the most absurd institution, one where stated rationales and priorities may not match actual practices.

Of course, the link between bureaucracy and absurdism is forcefully advanced by Franz Kafka's bureaucratic novels, wherein the insistence on rationality is taken to a farcical degree. However, a related yet distinct form of absurdism is emerging in the Brazilian state. The preponderance of minor blockages is not solely the result of an overemphasis on rationality. Instead, the postcolonial and post-Inquisition state, mired in epistemic murk, is absurdist because it relies on an opposition to rationality. While the Brazilian state is now largely secularized and far from its Inquisitional roots, this absurd core of bureaucracy seems to be reasserting itself in the midst of the climate crisis, despite desires by climate scientists to guide governmental action through science and reason.

I have not been able to resolve my confusion at Maria's initial statement. Why would FEAM, of all institutions, be the most opposed to environmental action? I am not sure that any

definitive answer is possible. However, understanding FEAM as an absurdist bureaucracy takes the disorientation of minor blockages seriously. One could never be sure of where things will be tomorrow. Did I forget to press “print” on my document? Or was the paper stolen off the printer? Maybe it was just an accident. Efforts to clarify the situation may only result in more confusion, or more danger. In the following chapter, I will explore the practical efforts to conduct oneself ethically in a setting where the ground seemed to be falling apart; sometimes dramatically, but more frequently in the form of a banal, persistent, nuisance.

Chapter 5: FACING HORROR
Transversal Ethical Experiments for Climate Governance

"We need a thinking that does not fall apart in the face of horror, a self-consciousness that does not steal away when it is time to explore possibility to the limit."
George Bataille, Preface to the History of Eroticism

How does one conduct oneself when the world seems to be falling apart? In many ways, this question was the core of my research from the very beginning, perhaps even before choosing to study anthropology, and was the concern to which I found myself continually returning as I learned more about the stupendous scale of the climate crisis and the insidious creep of authoritarianism. Where do we turn when old structures and guides fail? If the world is in some sense becoming *unknowable*, what does that mean for our ability to *know what to do*? Is it possible to act ethically in such circumstances?

In the previous chapters, I have outlined how the climate crisis undermines our sense of knowing the world, either through catastrophic disasters or banal, minor blockages. This chapter is my effort to understand an emerging, non-systematic "transversal" style of ethical thinking that responds to these challenges by rethinking the centrality of knowledgeable expertise. This is not an effort to create or articulate a new moral system with clear-cut instructions on how to address the climate crisis. Rather, I argue that the horrors of the climate crisis demand a new mode of relating to morality which does not assume a direct translation of reasoning into action. In the terms of Michel Foucault, this shifting form of a relationship with morality is about a change in a "mode of subjectivation." Paying attention to the ways in which environmental analysts comport themselves, evaluate decisions, and conceive of morality reveals that the historical centrality of knowledge, or *logos*, to ethics is transforming. Through an examination of the emic category of "transversality," I argue that this new form of ethical thinking is already

taking form in Minas Gerais, and can provide constructive guidance for others seeking to address the climate crisis.

This chapter is divided into two sections. The first section explains Foucault's analysis of ethics to clarify the method and stakes of my argument. Ethics is not an easy topic for anthropology to address. Many may think that this is a topic better suited for moral philosophy or theology. After all, anthropology is a largely empirical pursuit while ethics is primarily normative. As many moral philosophers from David Hume to G.E. Moore have forcefully argued, no number of empirical claims about what "is" ever produces a normative "ought." To respond to this legitimate critique, I will examine how Foucault establishes ethics as a field of legitimate empirical and historical analysis.

The second section of this chapter provides a genealogy of "transversality." This historical articulation of how transversal thinking took form in the works of Félix Guattari before being taken up in Brazil by the liberation theologist Leonardo Boff, the former minister of the environment Marina Silva, and eventually by the Mineiro environmental institutions, demonstrates the creative appropriations and refashioning of modes of subjectivation in light of the climate crisis. Through this genealogy, one can see the emergence of a mode of ethics which does not center knowledge. Instead of first asking that we *know*, transversality engages with a wide variety of different forms of knowledge which it *uses* to create a viable course of action. In other words, transversality uses knowledge rather than granting knowledge absolute priority. This form of ethical thinking is particularly well suited for the horrors of the climate crisis because it does not demand masterful expert knowledge of a constantly mutating situation.

Foucault's Historical Analysis of Ethics

My argument relies heavily on the analysis of ethics outlined by Michel Foucault in his studies of the transformation of Hellenistic "care of the self" into early Christian salvation. This material is primarily contained in his *Collège de France* lectures delivered between 1979 and his death in 1984 (2016; 2011; 2012; 2006; 2017) as well as the published draft of *Les aveux de la chair* (2018). In this material, Foucault historicizes ethics, rendering the terms of moral philosophy and theology open for empirical, rather than solely theoretical, analysis. This task had already been accomplished to an extent by Nietzsche's *Genealogy of Morals*, which argued that moral terms were not transcendental, but rather formed in the subterranean "workshop where ideals are manufactured" (1989, 47), but Foucault's project differs in two vital aspects. First, where Nietzsche's polemic against "slave morality" creates an allegory which serves to critique moral terms, Foucault engages much more thoroughly with empirical data in order to present the emergence of a particular form of "experience" of the self in the "West" (Foucault 1985, 4). Compared to his inspiration, Foucault is evidently more interested in the actual history of ethics rather than solely arguing that ethics can be historicized. Second, Foucault's critical examination of the modes of ethical self-care is fundamentally less "negative" than Nietzsche's. Foucault is interested in how we come to understand ourselves and what modes might be available to live differently (Foucault 1997). This is a "positive" project intent on finding new ways of living well.

Foucault's history and analytic framework allows us to better appreciate how ethics changes. Understanding how contemporary forms of ethics came to be opens up the possibility for an ethics of the future which may not resemble that of the past. Therefore, at a moment when the world in which we live is radically changing, undermining all of our traditional modes of

relating to our planet, our communities, and ourselves, a Foucauldian re-examination of ethics becomes vital if we are to find a new way forward that remains ethical.

Nuance is helpful here. It is easy to assume that if ethics needs to change, it must change completely. This utopian, vanguardist mentality is widespread in the history of social-scientific studies of morality. Responding to the Industrial Revolution, Henri de Saint-Simon's *L'industrie* argued that the collapse of "celestial morality" demanded a transition to a yet-unknown "terrestrial morality" (1966, 37). This effort to scientifically create a new morality through social reform provided the justification for Auguste Comte's Positivism and, in turn, Emile Durkheim's sociology of morality (Boltanski and Thévenot 2006, 120). The central project for these early sociologists was to provide an outline for a new form of morality which could supersede religious faith. Consider Durkheim's prophetic, almost Nietzschean, concluding note to *The Elementary Forms of Religious Life*:

> In short, the former gods are growing old or dying, and others have not been born. This is what voided Comte's attempt to organize a religion using old historical memories, artificially revived. It is life itself, and not a dead past, that can produce a living cult. But that state of uncertainty and confused anxiety cannot last forever. A day will come when our societies once again will know hours of creative effervescence during which new ideals will again spring forth and new formulas emerge to guide humanity for a time. (1995, 429)

Building on the Saint-Simonian and Durkheimian legacy, contemporary anthropologists of morality (Fassin 2008; Zigon 2007; Laidlaw 2014; Mattingly 2012) have largely preserved the image of ethical life in which human beings, individually or collectively, generate the moral codes that guide action. The goal of the human sciences in this tradition is to critique or articulate a new code which would produce a "better society."

Foucault's analysis of ethics allows us to move away from this tradition. Rather than treat a study of ethical codes as an exhaustive study of morality, Foucault introduces four elements

which relate the individual to moral codes. These four elements intercede between the individual and the moral code, therefore bracketing the actual content of moral codes from the analysis. Clarifying these four elements of ethics allows us to provide an account of the transformation of ethical life that is much less utopian. The goal is not to messianically provide a new morality, but rather to register the means by which the ongoing reimagining of ethical life is already taking place.

The four elements of ethics are (1) *ethical substance,* (2) *modes of subjectivation,* (3) *ethical practice*, and (4) *telos*. The "ethical substance" is the element of the self which is taken up and transformed in ethical practice (Foucault 1983, 238). This substance may range from Christian preoccupations with "flesh" to Kantian concerns with "will." Whatever is taken as the object of ethical consideration constitutes the ethical substance. The "mode of subjectivation" is the "way in which people are invited or incited to recognize their moral obligations" (Foucault 1983, 239). It is the relationship that the subject forms with the moral code, how they relate themselves to their values or exemplars, rather than the moral code itself.[36] The "ethical practices" are the concrete actions which shape the ethical substance in accordance with the moral system, "the means by which we can change ourselves." Finally, the "*telos*" is the "kind of being to which we aspire when we behave in a moral way" (Foucault 1983, 239). This might be "salvation" for a Christian or "nirvana" for a Buddhist.

[36] In his account of Foucault's analysis of ethics, James Faubion presents the modes of subjectivation as "an index of the 'deontological' – precisely that aspect of the ethical domain which has to do with obligation or duty" (2011, 50). However, this rendering misconstrues the role of moral duty in Foucault's analysis of ethics. All four elements of Foucault's analysis could be applied to any deontological style of ethics insofar as all these moral codes imply particular substances, practices, goals, *and* relationships between the subject and duties. However, even non-deontological moralities involve modes of subjectivation. For instance, Caroline Humphrey's (1997) ethnography of Mongolian ethical life argues that rather than moral rules, traditional Mongolian ethics depends on the selection of historical "exemplars" to guide action. In this case, the "mode of subjectivation" refers to the connection that the ethical subject perceives between themselves, their situation, and their chosen exemplar. One need not jump to a conception of rules, duties, or obligations in order to identify the mode of subjectivation.

When ethical thinking changes, it can happen piece by piece rather than all at once, through modifications to one or more of the elements. In the published draft of *Les aveux de la chair,* Foucault charts how the Hellenistic ethical traditions led to the emergence of early Christianity. While the ethical substances, practices, and teloi of Christianity fundamentally changed, the mode of subjectivation remained constant in order to avoid criticisms of immorality lodged by Roman critics (Foucault 2018, 10). Forecasting my argument about the mode of subjectivation taking form in Minas Gerais, it will be helpful to clarify the mode of subjectivation which revolves on the priority of "truth" or *logos*. It will then be easier to see how a response to Battaille's challenge in the epigraph, to find a form of [ethical] thinking "that does not fall apart in the face of horror," demands separating the centrality of *logos* from ethics.

Reasonable Ethics

Accused of corrupting the youth through rhetorical sophistry, Socrates famously insisted that he, in fact, "knew nothing." In his final days documented in the *Apology*, *Crito,* and *Phaedo*, as well as throughout his appearances in Plato's dialogues, Socrates positions himself as a mere intermediary between his interlocutors and *logos* (Foucault 2012, 152; Carey 2019). It is through learning to attune oneself with this logos that one learns to not only care for oneself, but to care for the world. What exactly Socrates means by *"λόγος*" or "*logos*" is open to interpretation. One translation of the term *"λόγος*" used by both Heidegger and subsequently Foucault is "discourse" ["*Diskurs*" or "*discours*"] (Heidegger 1962, 55).[37] However, the pre-Socratic philosopher

[37] Critics of Foucault's anthropocentrism may overlook the non-linguistic elements of "discourse" implicit in the Heideggerian affiliation between "discourse" and "*logos.*" For Heidegger, "discourse" refers not only to language, but rather that which "makes manifest" phenomena in general. Only when it is "fully concrete" does it "have the character of speaking – vocal proclamation in words" (Heidegger 1962, 56). This "full" concretization clearly privileges language, but non-linguistic discourse like art is still possible. Likewise for Foucault, "discourse" is only provisionally linguistic. As he states in an early methodological formulation of "discourse," his emphasis on "the 'sciences of man'" provides only a "provisional privilege" for linguistic discourse (Foucault 1982, 30). This is why

Parmenides forcefully distinguishes *logos*, frequently translated as "truth" in commentary, from that of "conviction" or "opinion" (Kirk, Raven, and Schofield 1983, 239–62). When Socrates speaks of an affiliation to *logos,* he does not mean just any kind of discourse, but rather a "true discourse." In other words, Socrates argues for the unification of ethics and rational knowledge.

The alliance between truth and ethics should not be understood as a distinct ethical theory. Rather, in the terms of Foucault's analysis of ethics, Greek philosophy inaugurates a mode of subjectivation whereby the subject is tied to morality through a relationship of truth. It is because one *knows* what to do, or what to value, that the subject is guided towards the proper goals and practices. Morality becomes something that can be known, debated, and investigated through epistemology. The link between knowledge and ethics emerges at this moment as a justification for the moral systems that embrace it.

We can see this *logos*-centered mode of subjectivation strongly embraced by later Hellenic and early Christian moralities. On this basis, Platonists, Stoics, and Epicureans develop theories of ethically useful knowledge such as "*ēthopoios,*" the analysis of how particular knowledge can produce ethical ways of being (Foucault 2006, 237), *"phusiologia,*" knowledge about the physical environment which guides action (Foucault 2006, 238), and "*paraskeuē*," ethical maxims which prepare the subject for later challenges (Foucault 2006, 240). These are all distinct forms of ethical knowledge and practice which rely on the foundational role of true discourse, *logos,* to lead to ethical improvement.

Foucault readily incorporates artistic and architectural sources in his archaeological studies. Neither Foucault nor Heidegger equate "discourse" with language, even if both grant language a methodologically privileged status given their particular inquiries. It is also for this reason that we should avoid confusing Foucault's discussion of the centrality of *logos* in morality with Derrida's critique of "logocentrism," which focuses on a translation of *"logos*" as language.

A particular Stoic example is illustrative of this link between *logos* and ethics. In Seneca's *De Brevitate Vitae,* the reader is encouraged to meditate on the difference in scale of concerns for one's immediate surroundings with the massive scale of the movement of the heavens. In considering this "view from above," the meditator will come to realize the trivialness of their anxieties and reach a state of calm (Foucault 2006, 282). This is a particular example of *paraskeuē,* a meditation which translates *logos* into *ethos*. Knowledge about the cosmos produces an ethical effect, not necessarily by handing down a law, but by compelling the subject to consider themselves in a new way.

With the Abrahamic monotheisms, the centrality of *logos* for ethics takes on an intensified form. Within these monotheisms, *goodness, beauty,* and *truth* increasingly formed a central unity coordinated by the divine (Sloterdijk 2010). For Judaism, the linguistic relationship with the divine constitutes one of the privileged forms of reverence (Patterson 2004). *Logos* continued to serve as a dominant mode of subjectivation for these ethical systems whereby knowledge of the "Truth," now incarnated in the form of a divine cosmology, provided the justification for religious commandments. For the early Christians, this connection was explicit. Clement of Alexandria's response to "pagan" Neo-Platonist and Stoic critics of Christianity equated God with *logos*. It was because Christian dogma reflected the true *logos* of the world that Christian ethics were justified. Acting in accordance with *logos*/God led to the *telos* of salvation (Foucault 2018, 14). Just as Socrates had once claimed to be a mere intermediary for *logos,* the early Christians once again saw themselves as messengers for a universal divine rationality that not only governed the world, but rewarded those who followed its dictates (Foucault 2016, 2).

From this foundation, *logos* and reason go on to become an unquestioned element of "Western" moral thinking. Even with the growth of secular ethical philosophy, *logos* remained a privileged mode of subjectivation. For example, in Pierre Bayle's 1686 argument for the legitimacy of human interpretation over religious authority, an emphatically secular argument, he argues that "all particular Doctrines, whether advanc'd as contain'd in Scripture, or propos'd in any other way, are false, if repugnant to the clear and distinct Notions of natural Light, especially if they relate to Morality" (2005, 75). In other words, because *logos* rules over the divine as well as the human, and because human beings are endowed with reason, human interpretation of the scripture can independently judge the validity of actions. Up to contemporary philosophers, the vast majority of moral theory has assumed that *reasoning* provides a privileged justification for moral claims (Jonsen and Toulmin 1989, 302). The presumed content of *logos* changes with the specific philosopher, but the pre-eminence of the rational mode of subjectivation is widely shared.

The presumed privilege of logos is perhaps why Foucault's concept of the "mode of subjectivation" is the least clear of his four analytical axes. For example, Paul Rabinow accepts without question the Stoic assertion that "all equipment (*paraskeuē*) is composed of *logoi*" and that, therefore, the ethical challenge for anthropology is to select the appropriate set of truth claims to guide action (Rabinow and Stavrianakis 2014, 54).[38] However, this equation eliminates

[38] This confusion is somewhat surprising given that the term "mode of subjectivation" originates from Rabinow and Dreyfus' interview with Foucault in 1983, one year after the Collège de France lecture series on Stoic ethics. While *Les aveux de la chair* was as yet unpublished, the subtitle of the Dreyfus and Rabinow interview ("An Overview of a Work in Progress") is likely a reference to that text. Records at the Berkeley Foucault archive show that Foucault was actively researching and drafting it during this time. In an afterward to the published interview, Dreyfus and Rabinow show that they are aware of *Les aveux de la chair*, although they refer to it as volume 3 of the *History of Sexuality* rather than its eventual position as volume 4 (1983, 253–54). This misplacement likely reflects Foucault's own continually changing plan for the series which originally placed *Les aveux de la chair* as volume 2 (Osario and Foucault 1976). All of this archival work demonstrates that Rabinow and Foucault were likely aware of all of the material discussed here by the time they discussed "modes of subjectivation" in 1983. The conflation of modes of subjectivation with a relationship to *logos* reasonably follows from Foucault's own interests and priorities. If

the capacity for alternative modes of subjectivation. We can easily think of examples of different ethical practices, goals, and perhaps even substances. However, if, as I have examined here, *logos* has served as the principal mode of subjectivation from early Greek philosophy through the monotheisms and up through academic moral philosophy, it is hard to gain the level of contrast necessary to clearly and easily understand what alternatives are possible for a mode of subjectivation.

However, it is necessary to understand the particulars of this *logos*-centered mode of subjectivation in order to clearly perceive the new form taking shape. The conflicts within scientific bureaucracies and which more broadly characterize the domain of climate politics cast doubt on the capacity of any one *logos* to guide action for all. Even if climate scientists somehow could make everyone listen (which is unlikely), the challenges of complexity and the destabilizing effect of disasters force us to question whether or not knowledge alone will be enough to guide action. As the horrors of the climate crisis thrust us into a world which is increasingly unknowable, as demonstrated in the preceding chapters, we may ask ourselves what ethics might look like divorced from *logos*.

Transversal Governance

How can an anthropologist examine the contours of ethical life? Methodologically, I conducted interviews which focused on the decisions and motivations that brought individuals to work at GEMUC. This line of questioning exposed the deliberations and priorities of the climate

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Foucault's central question, as described repeatedly by himself, is the formation of the subject as an object of legitimate knowledge (Foucault 1999a), then ethical self-formation through a relationship with *logos* takes on a privileged position. However, despite my clear reliance on Foucault for framing my analytical questions, I am not attempting to ask the same questions as Foucault or Rabinow. I am not primarily interested in the articulation of *anthropos* and *logos.* Therefore, the broader scope of modes of subjectivation must be stressed even if the concept's originators may not have been concerned with these new avenues of investigation.

analysts that guided them to government careers and exemplified new forms of ethical thinking taking form in the face of the climate crisis. In these considerations, values are weighed, options evaluated, and strategies considered. While seemingly divorced from traditional topics in the anthropology of morality, such as humanitarianism (e.g. Fassin 2012; Scherz 2014), religion (Faubion 2011; Mahmood 2012), bioethics (Cohen 1999; Sharp 2013), or therapeutics (Zigon 2007; Davis 2012), the deliberations taking place within the scientific bureaucracy bear many of the hallmarks of ethical reflections. In Foucauldian terms, these questions of motivation and desire reveal how modes of subjectivation draw individuals into particular practices.

Many analysts answered my questions about motivations pragmatically: After completing a university degree, they took the test required for placement at a government job in order to find secure employment.[39] For many of the analysts, their placement within the environmental ministries following their exams reflected their choices to study geography, electrical systems engineering, or other related topics. When asked why analysts wanted to study these particular topics, the answers revealed a series of evaluations of ethical considerations. Some reported a deep, emotional attachment to the land of Minas Gerais. For many, government was not the only possible route for employment. As one analyst laid out for me, students with advanced educations in the natural sciences have three possibilities available to them. The first is to continue in academia, perhaps get a Ph.D., and look for positions as researchers or teachers in the university system. The second is to take their expertise to private industries where there may be more options, but they would be beholden to the ebbs and flows of market forces. Finally, there

[39] Initially, this might appear as simple self-interest, but the philosopher Peter Sloterdijk cautions against reductive interpretations of egotism. As he asks in his study of 1920-1930s German moral life, "What is self-interest in someone who no longer knows where his 'self' is?" (1987, 114) Sloterdijk's question reclaims "self-interest" as a topic of ethical interest, particularly in moments of profound disorientation.

was the path of government work. As the one analyst told me, “This is where I thought I could make a difference.”

Within the governmental domain, there were still more choices to be made, especially for the more senior members of GEMUC. Why work here, rather than any other section of the government if given the opportunity? In response to my questioning, an energy engineer by training explained to me the appeal of her work: “My preference is to work on energy, but that does not mean that I do not work with other things. In our office, we have very transversal projects… Do you understand ‘transversal?’ Energy is a very important part of our projects, but there is also agriculture, the question of adaptation to climate change, and so on.” She enjoyed the expansive scope of her work on climate change and that it allowed her to bring her expertise on energy to bear on a wide variety of topics. This was a theme I often heard in these discussions, frequently alongside the term “transversal” which she was concerned that I would not know.

I thought that I did understand what it meant to be “transversal” from the context. While I had not heard the term before, I assumed that it was perhaps a Portuguese term or government jargon for “interdisciplinary.” However, when analyzing my transcripts back in Montréal, I decided to take her challenge more seriously. Did I really understand “transversal?” Looking through my notes, I found the term scattered throughout. Many other interviews included the term in similar usages. The *Plano de Energia e Mudanças Climáticas*[40] document includes a section on “transversal tools,” actions which cross across sectoral boundaries within the government bureaucracy.

[40] This is the official state plan for climate change governance and was the key document for GEMUC’s work, both in producing it between 2007 and 2015 and implementing its directives afterwards.

I began to dive into the history of "transversality" in order to understand more. To check my assumption, I tried to look up "transversal" in my Portuguese dictionaries but could not find any references. Working in the opposite direction, I looked up terms like "interdisciplinary" and "synergistic." All the related terms I could think of had their own direct translations without any reference to "transversal." This was my first clue that I was missing something. Perhaps this word I had brushed off contained more nuance than I had assumed.

My next step was to search the *Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável* (SEMAD)[41] website for any reference to transversality. Tantalizingly, the earliest document to include the term was a speech delivered on 2 January, 2003 by Marina Silva, Lula's enormously successful and controversial Secretary of the Environment. It was her first speech in her new role. In it, she discusses the need to create a "transversal" environmental agency, one which would address the environment as a simultaneously societal and ecological concern. In the next sentence, she credits this lesson to her teacher, the liberation theologist Leonardo Boff.

Suddenly, "transversality" was no longer just a buzzword. Unravelling its genealogy reveals an intricate mode of subjectivation, a transversal mode of relations to morality, as the term shifts from mathematics to critiques of psychoanalysis to radical Christianity and finally into bureaucratic tactics. Cultivating a transversal ethos presents an experimental mode of engaging with the climatic crisis, one which may uniquely address many of the challenges faced by climate governance by displacing *logos*.

[41] In the bureaucratic hierarchy of my work, SEMAD is the highest rank of environmental governance in Minas Gerais, reporting directly to the Governor.

Configuration 0: Two-dimensional Geometry

The term "transversal" originated in geometry, referring to a line passing through two other lines on the same plane (line "t" in fig. 17). In this case, "transversal" displays its etymology as "turning" (*vertere*) across (*trans*). Altogether, a transversal line entails four elements: two lines which may or may not be parallel, a place which contains the two lines, and the final, transversal line.

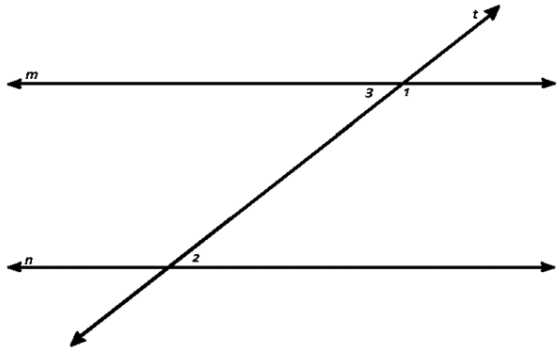

Figure 17: Two parallel lines and a transversal.

To speak of "transversality" as "originating" with this figure misunderstands the significance of transversality in later formulations. While many of the configurations of transversality yet to come will draw on the four elements of transversal lines (three lines and their parallel or intersecting positioning), it would be difficult to deduce these later forms from this initial point. In other words, the geometry of transversal lines is not the "seed" which contains the "tree" of transversal ethics.

In his analysis of Nietzschean genealogy, Foucault (2010) cautions against the search for origins as a substitute for an analysis of the nuanced, ongoing practices which bring the past into the present. The relative ambiguity of transversality's genealogy provides a clear example of this process. As will be shown, the geometric sense of transversality provides a name and image for forms of thought which will find precursors in distinct domains, whether theology, *socioambientialismo*, or bureaucratization. Conducting a genealogy of transversality does not follow this ethic back to an original source, but rather follows a particular tributary as it merges

and splits from other streams. Routes are selected for their instructional quality. Given the abstractness of an ethics of transversality, I have chosen to begin with this concrete form, but this should not be understood as the "true" transversality any more or less than its later forms.

Configurations 1-2: Group Therapy to Ecology (Félix Guattari)

The first step in the translation of transversality into a mode of subjectivation was accomplished by Felix Guattari's critique of psychoanalytic therapeutic practices. Transversality constitutes one of the central, enduring themes of Guattari's individual work, undergoing significant transformation both when he adopted the term and when he adapts the term to ecocriticism (Genosko 2002). Originally a psychoanalytically trained psychotherapist, Guattari facilitated group therapy sessions in the 1960s in a Parisian institution. The model of psychoanalysis he practiced, derived from Freud via Lacan, focused on a one-to-one relationship between the therapist and the patient. Psychoanalytic theory referred to this relationship as a domain of "transference." The relationship between the patient and the analyst was thus something akin to a staging ground for the relationships and neuroses in the patient's life. Within this domain, affects and symptoms emerged and could be addressed by the therapist.

However, Guattari found that the institutional confines of his work which forced him to practice group therapy could not reliably produce this kind of intimacy. As a group therapist, Guattari did not have the luxury of creating an intimate relationship with each of his patients one-on-one. Instead, he needed to find a way to help his patients in a collective setting. In 1964, Guattari delivered an address to the International Psycho-Drama Congress where he proposed replacing the focus on transference with a new concept, "transversality" (Genosko 2002, 68). While the term had already been briefly used by Jean-Paul Sartre in a critique of phenomenology

and by Louis Althusser in a discussion about the relationship between modes of production and science, Guattari's speech, later published simply as "Transversality" (1984), represents the earliest substantial philosophical formulation of the concept (Bosteels 1998).

In Freudian psychoanalytic therapy, the transference between the patient and the analyst allows for "latent content," like repressed associations, to become "manifest" (Freud 2008). In Guattari's experience of group therapy, this model grants undue authority to the analysts to shape expression, masking the hierarchical structure of therapy behind a naturalized psychotherapy (1984, 17).[42] The therapist held the knowledge presumed necessary for the patient, and the patient was merely the receptacle for the therapist's lessons. Beyond the risk of speaking over the patient, Guattari charged this model of psychoanalysis with overlooking the sociopolitical causes of neuroses: "[Fixed transference] is a way of interiorizing bourgeois repression by the repetitive, archaic and artificial re-emergence of the phenomena of caste, with all the spellbinding and reactionary group phantasies they bring in the train" (1984, 17). In other words, the prioritization of transference cemented the analysts as an authority figure in a domain which suffered under the burden of hierarchy.

In contrast, Guattari's proposed modification, "transversal" therapy, sought to create the conditions within a group where interpretation of latent content could be provided by anyone. "The interpretation may well be given by the idiot of the ward if he is able to make his voice heard at the right time, the time when a particular signifier becomes active at the level of the structure as a whole, for instance in organizing a game of hop-scotch" (Guattari 1984, 17). The therapist ceases to act as an authority and instead takes a more modest role as a facilitator, creating spaces and periods where "there is maximum communication among different levels

[42] Guattari's critique of the authoritarianism of psychoanalysis would later inform his collaborations with Gilles Deleuze (Deleuze and Guattari 1983).

and, above all, in different meanings," a measure which Guattari more technically calls the "coefficient of transversality" (1984, 18). Through the practice of maximizing transversality by encouraging communication between patients, Guattari was able to create a unique therapeutic space within an institution which decentralized analytic authority.

While stemming from a practical response to a concrete problem, Guattari's address already starts to look beyond the walls of the hospital. Echoing Franz Fanon's (2005) analysis of psychotherapy in colonial contexts, originally published three years prior, Guattari observes that patients do not arrive at psychiatric hospitals from a vacuum. The myopic focus on transference precluded an appreciation for the personal histories which brought patients to the hospital, resulting in "a systemic failure to understand what is going on outside the hospital walls, [and] a tendency to psychologize social problems" (Guattari 1984, 11). Maximizing the coefficient of transversality by encouraging communication between distinct domains means treatment cannot be limited to the hospital ward, nor even individual patients; it must radically address the creation of neuroses wherever it occurs. For Guattari, the "real power" which constrains transversality, inside and outside the hospital, is the political-economic structuring of liberal society (1984, 19). Thinking of the image of a geometrically transversal line, Guattari's initial formulation of transversal therapeutics can be seen crossing between various domains: person to person, authority to subordinate, and hospital to society.

By the 1980s, Guattari's work transitioned out of the clinical context and into philosophy more broadly. The upheavals of *Mai '68* and his subsequent collaborations with Gilles Deleuze had made Guattari a "public intellectual." As he broadened the scope of his work, Guattari's concept of transversality underwent a transformation as well. In particular, a modified form of transversality informed Guattari's approaches to the New Left and ecology. No longer

constrained by his practical concerns for therapeutics, Guattari now envisioned transversality as the movement across all domains, much like the "lines of flight" which escape any form of rigid codification (Deleuze and Guattari 1987). For the New Left social movements, transversality signaled the challenges posed not only to institutions, but also to forms of subjectivity. Protests against racism, sexism, or homophobia did not simply demand legal changes. They asked people to "become" otherwise, to change how they conducted and understood themselves (Guattari and Rolnik 2007, 102).

Ecologically, transversality referred to the endlessly expanding webs of relationality that constitute organic life. Specifically, transversality comes to stand in for an overcoming of the nature/culture divide: "Now more than ever, nature cannot be separated from culture; in order to comprehend the interactions between ecosystems, the mechanosphere and the social and individual Universes [*sic*] of reference, we must learn to think 'transversally'" (Guattari 2008, 43).[43] Transversal thought becomes a form of ecological thought. Like ecology itself, transversality seeks to forge the connections between disparate entities. Specifically, the distinctions that Guattari considers most salient are the titular "three ecologies:" "the environment, social relations, and human subjectivity" (2008, 28). Transversality crosses the boundaries of each of these domains without negating their uniqueness. For his conception of relational ecology, Guattari turns to the anthropologist Gregory Bateson, specifically his 1969 paper "Pathologies of Epistemology" (2000). Here, Bateson refuses to distinguish between mind and nature by formulating ecology as "the study of the interaction and survival of ideas and

[43] Shockingly presciently, the passage immediately continues: "Just as monstrous and mutant algae invade the lagoon of Venice, so our television screens are populated, saturated by 'degenerate' images and statements. In the field of social ecology, men like Donald Trump are permitted to proliferate freely, like another species of algae, taking over entire districts of New York and Atlantic City; he 'redevelops' by raising rents, thereby driving out tens of thousands of poor families, most of whom are condemned to homelessness, becoming the equivalent of the dead fish of environmental ecology" (Guattari 2008, 43).

programs (i.e. differences, complexes of differences, etc.) in circuits" (2000, 491). Ecology for Bateson, and thus for Guattari, emphasizes the relations and interactions between all entities.

Within this expansive ecological sphere, transversality provides Guattari with a means to track forces and entities as they cross various domains. It therefore provides a direct answer to the challenges of an ecological crisis which shatters conceptual and disciplinary frames. In a critique of educational policy, Guattari contrasts transversality with transdisciplinarity, the proposal that various university departments must collaborate. While a welcome step towards an expansive approach to ecological problems, Guattari expresses skepticism about the ability of transdisciplinarity to pose "new questions" given that it maintains the institutional disciplinary boundaries. Instead, "transdisciplinarity must become transversality between science, the socius, aesthetics and politics" (Guattari 2015, 134). The very disciplines themselves must be decomposed in the face of the crisis. Only through this thorough transformation will education match the scope of the challenges which themselves transverse traditional categories.

Already in Guattari's work, we see that transversality is more than the simple selection of a new *logos*, or even multiple *logoi*, as a guide for action. From his earlier work through the later ecological work, the role of knowledge itself is recast. There is no longer a central authority who governs the psychiatric ward or the environment through their expertise. Instead, the *logoi* of psychology or environmental science are themselves re-formed in transversal practices.

Guattari carried the concept of transversality with him as he traveled to Brazil in 1982, where he met with many members of the pro-democracy movement including the future president, Lula da Silva. Guattari described these dispersed and variegated pro-democratic movements as "transversal" in the ways that they multiplied across lines of class, race, and sexuality (Guattari and Rolnik 2007, 102). Many of the Brazilian democrats found Guattari's

work and link to the *Mai '68* movement inspiring. They integrated his work into their own reflections on the ecological and social upheavals of the dictatorship.

Configuration 3: Into the Theosphere (Leonardo Boff)

One of the Brazilians influenced by Guattari's notion of transversality was the liberation theologist Leonardo Boff.[44] Especially since his entrance into the Franciscan order in 1959, Boff's writings and public engagement pushed Catholic institutions to better act in solidarity with the poor and the environment. This political activism led to the Congregation for the Doctrine of the Faith, then led by the future Pope Benedict XVI, condemning Boff in 1985. Subsequently, however, Pope Francis cited Boff as an inspiration for addressing climate change in his 2015 encyclical *Laudato Si'* (Stephenson 2015).

In his most famous book, *Ecologia: Grito da Terra, Grito dos Pobres* (1995), translated into English as *Cry of the Earth, Cry of the Poor* (1997), Boff stresses the importance of Christianity combatting both the oppression of the poor and the extraction of resources from the earth. Boff envisioned both of these struggles as unified practically and equally motivated by faith: "The logic that exploits classes and subjects peoples to the interests of a few rich and powerful countries is the same as the logic that devastates the Earth and plunders its wealth, showing no solidary with the rest of humankind and future generations" (1997, *xi*).

The central point of Boff's argument for integrating social activism, environmental concerns, and liberation theology rests upon his understanding of ecology. For him, "Ecology is the relation, *inter-action* and dialogue of all existing things (living or not) among themselves and

[44] While Boff refers frequently to Guattari, it is unclear precisely when and where Boff first encountered Guattari's work. Boff is not listed as being in attendance at any events included in *Molecular Revolution in Brazil* (Guattari and Rolnik 2007).

with everything that exists, real or potential" (2008, 21, translation by author, emphasis original). Similar to Bateson and Guattari's understanding of ecology, the key feature of Boff's ecology is its relationality which exceeds traditional boundaries. Like Guattari, Boff presents this expansiveness as a form of transversality:

> The peculiar feature of ecological knowledge is its transversality; namely, the fact that it relates laterally (ecological community), frontward (future), backward (past), and inwardly (complexity) all experiences and all forms of comprehension as complementary and useful in our knowledge of the universe, our role within it, and the cosmic solidarity which unites us all. […] It does not mean the sum of knowledges or of a number of analytic standpoints, for that would be a quantity. Rather, it translates the grasp of the organic and open whole of reality and of knowledge of this whole; it therefore represents something new. (1997, 6)

Ecology demands more than a multiplication of viewpoints. It requires a transversal, not transdisciplinary, approach which reshapes the division between viewpoints themselves.

It may seem that *logos* takes a central role in Boff's transversality. After all, Christian faith is a prototypical example of a transversal mode of subjectivation, and the term "ecology" bears the etymological root of *logos*. In this regard, Boff's version of transversality displays the tensions between the centrality of *logos* and the new forms of ethical thinking taking shape. However, the preceding passage by Boff merits closer attention, revealing a glimpse of that new form of relationship between knowledge and ethics. Transversal ethics takes a standpoint outside or beyond knowledge. This standpoint is characterized by two features. First, rather than holding one *logos* as privileged, Boff continues Guattari's turn towards multiple *logoi*. Theological knowledge of the divine is placed equally alongside ecological knowledge of the environment and sociological knowledge of poverty. Second, while transversality utilizes knowledge, whether ecological, theological, or sociological, Boff describes "transversality" as a multidirectional "relation" to knowledge. To reiterate, "It does not mean the sum of knowledges or of a number of analytic standpoints."

The evaluation of the proper form of knowledge requires a mode of subjectivation grounded in something other than *logos*.[45] Boff explicitly lays out this starting point in his introduction to liberation theology co-written with his brother Clodovis: "Underlying liberation theology is a prophetic and comradely commitment to the life, cause, and struggle of these millions of debased and marginalized human beings, a commitment to ending this historical-social iniquity" (Boff and Boff 1987, 3). The beginning of liberation theology is solidarity. Theology, rather than serving as the entry point for this form of transversal ethics, *becomes* useful because of what it can offer to solidarity. However, as it is not the only form of knowledge that may prove helpful. Here, we can start to see how the transversal, transdisciplinary, perhaps we could say "translogical" ethics contrasts itself with the Stoic or early Christian insistence that knowledge of the Truth was the beginning of ethics.

However, Boff retains an element of the monolithic ethics in the form of cosmology. From his expansive definition of ecology, Boff proposes that the fulfilment of the covenant between God and humanity must take the form of an expansive holism:

> Just as cosmogenesis (the lithosphere, the hydrosphere, the atmosphere, and the anthroposphere) emerged from the original chaos, so also will the noosphere emerge – the communion of minds and hearts – as a center of life, solidarity, and shared growth in love. Everything will point toward the ultimate theosphere where all will be in God and God in all. […] In embracing the world, we shall be embracing God. (1997, xii)

This expansive "theosphere" provides an imagined space where transversality stitches together spirituality, ecology, and society. This might appear to render transversality a unified *logos*, but the key element here is the future tense. If transversality is the mode of subjectivation, the form of a relationship with ethics, the theosphere is the *telos*, the desired end goal of ethical practice.

[45] One could compare Boff's transversality with Emmanuel Levinas' argument for "ethics as first philosophy" (Levinas 1989). Levinas contrasts his approach with rationalist and phenomenological accounts which place knowledge as the necessary precursor to ethics. Instead, Levinas argues that one must *choose* to pursue knowledge. As this is an active choice, it falls under the domain of the ethical evaluation of actions.

While Boff desires for the holistic unification of the theosphere, his diagnosis of the actual situation is heterogeneous and fractured. What is important to note is that Boff's transversality navigates between diverse *logoi* in order to institute a unified and just cosmos.

Configuration 4: Back to Earth (Marina Silva)

The earliest significant mention of transversality within Brazil's environmental institutions occurred in 2003 as Marina Silva began her tenure as the federal Minister of the Environment for the newly elected Lula administration. In that role, Silva managed to translate her experiences as a *pardo* Amazonian woman, deeply inspired by Christianity and labour activism, into an incredibly effective tenure as Brazil's top environmental regulator. Between 2004 and 2012, deforestation in the Amazon dropped by 83%. Silva eventually left her position and the *Partido dos Trabalhadores* after disputes with future president Dilma Rousseff convinced Silva that the party would prioritize economic development over the environment (Freston 2018).

At her first speech to the Ministry of the Environment, with an audience of government bureaucrats, scientists, and activists, Silva was joined by Leonardo Boff, Silva's teacher, as she had grown up in the Amazonian state of Acre. Acknowledging Boff's presence in the room, Silva moves on to explain her vision of environmental politics:

> To make a partnership with society, our great challenge may be to cooperate, in the first place, among ourselves; perhaps it is to create transversal policy in our own house, then with the other sectors and then with society. Not one thing after another, but all together. If we do so, we will learn to offer what my Christian, evangelical faith, with liberation theology, the best of the Christian faith represented here by my friend Boff, taught me is the most important part of love: the other cheek. [Applause] (Silva 2003, translation by author)

Silva sets transversality as a central goal for environmental politics as it engaged with society. A transversal approach to environmental governance means viewing the environment as a space in which a multitude of various actors, and *logoi*, interact. Elsewhere in her speech, Silva describes transversality in geometric terms:

> The environment is the space par excellence to combine policies to combat hunger with policies to combat social exclusion with the environmental question. We have grand challenges to overcome. For this, we need to elaborate environmental policy that constitutes the structuring axes of our actions. And these structuring axes mean a transversal policy, a governmental action in which the Ministry of the Environment is not seen as an NGO, in which we diligently strive to convince our government partners to consider the environmental variables in their action. (Silva 2003, translation by author)

Viewed transversally, the environmental bureaucracies under Silva viewed environmental concerns as more of a means rather than an end. From within the Ministry of the Environment, Silva aimed to address a wide range of social and environmental concerns. The potential projects were broad, and so were the potential sources of expertise. There was not a singular set of knowledge which shapes this form of practice, but instead, a transversal view of the environment could shape the self-understanding and practices of a wider range of authorities. In other words, Silva formalizes transversality as a mode of subjectivation within the Brazilian government.

In doing so, Silva took up two Brazilian traditions. First is the clear allusion to liberation theology and Leonardo Boff specifically. Like Boff, Silva's transversality orients action towards a holistic goal. It pulls from a variety of different forms of knowledge, including ecology and sociology, in order to foster cooperation.

Second, Silva reintroduced the *socioambientialismo* approach popular among Brazilian environmentalists since the 1980s (Hochstetler and Keck 2007). This "socio-environmental" approach refuses to address environmental concerns separately from "social" questions such as poverty, Indigenous rights, and land distribution. Borne out of Brazilian labour movements, both

in agricultural lands and urban peripheries, *socioambientialismo* highlights the centrality of solidarity, class struggle, and labour rights in addressing the exploitation of both workers and environments.

Both liberation theology and *socioambientialismo* emerged from critiques of authority, whether ecclesial or state. As such, these traditions prepared Silva to reformulate the Ministry of the Environment's relationship with its own hierarchy and relation to knowledge. Rather than viewing the institution as the holder of truth which must inform all government action, the role of environmental governance is instead to provide a venue where information and actors can interact to accomplish a diverse set of goals. In Guattari's terms, we can see how Silva's vision for the Ministry of the Environment entails maximizing the "coefficient of transversality." Like Guattari, Silva does not envision the bureaucrat to act like the authoritarian analyst. Rather, the democratic ethos of *socioambientialismo* and the popular solidarity of liberation theology encourages the ministry to allow for action to emerge out of its cooperative partners.

In the following section, I will show how Silva's vision for a transversal approach to environmental governance played out in Minas Gerais. Transversality operated both to bring in environmental analysts, working in its role as a mode of subjectivation which produces a relationship between the individual and their values. Clearly following the tradition of Guattari and Boff, transversality also displaced the centrality of *logos*, producing an ambiguous relationship with knowledge despite the academic credentials and expertise of the climate analysts. Knowledge remains vital to practice, but it no longer serves as the starting point of ethical reflection. Instead, the key epistemic question is how can knowledge, in many diverse forms, be *used* to advance ethical goals.

Configuration 4.5: Transversal Tools

What does all this discussion of transversality mean in practice? And why should we be thinking about ethical modes of subjectivation now, of all times, in the midst of a climate crisis? First, as the horrors of rising authoritarianism and the climate crisis undermine and hinder conventional modes of scientific and political practice, it became clear to me and my interlocutors that new strategies and self-understandings are desperately needed.

By the 1990s, the environmental sociologist Robin Grove-White (1993) identified environmentalism as developing and distinct moral discourse. The development of transversal ethics in Brazilian environmental institutions contributes to this environmental "ethical imagination" (Santos 2013) by providing a new mode of understanding the role and objectives of environmental morality in practice.

Second, following the challenges to scientific authority discussed in Chapters 2 and 3, it is vital to consider ethics which divorces itself from the traditional centrality of *logos*. If ethics must prioritize knowledge, then the challenges to expertise would seem doomed to collapse into a form of nihilism. If we do not *know* what to do, how could we be ethical? I am arguing that by transforming the role of knowledge and authority, Silva's vision for transversality provides a potential answer.

Conversations about transversality with environmental analysts illuminated this vital challenge. For example, I met with Ana-Maria, a senior climate advisor for Belo Horizonte's municipal environmental office. She had started her career with the city in child services. A social worker by experience, Ana-Maria gained her experience in Belo Horizonte's city governance throughout the 1990s, during the mayoral administration of Patrus Ananias, a member of the *Partido dos Trabalhadores*. Ananias implemented a series of democratically-

oriented initiatives, including city-wide participatory budgeting for up to half of the total city budget (Baiocchi, Heller, and Silva 2011, 57). Ana-Maria characterized the city administration:

> The agenda was to do intersectoral [*intersetorial*] work, and the need for popular participation was raised early on. Venues for participation were created. We had councils, we had committees, we had surveys, we had public policy conferences, we had forms of social control. From early on we also realized that if the discussion was transversal [*transversal*] and interdisciplinary, then policies would end up bouncing off each other, and that Belo Horizonte was not isolated from the world. Thus, so when [Ananias] came in, he started to discuss the city's internationalization.

Transversality, along with interdisciplinarity, led to a new way of seeing the city. Rather than seeing the city bureaucracy as divided up into discrete sectors, government workers were encouraged to understand themselves and the city as a whole as only one particular locality in a globalized system. This perception of the city directly led to Ananias seeking out globalized networks of city officials to strengthen local efforts to address socioeconomic and environmental concerns.

One of those groups was ICLEI which later held its 2012 general meeting in Belo Horizonte. Ana-Maria was tasked with assisting the planning for this massive event. There, she realized that environmental concerns amplified her growing appreciation for transversal thinking. As she put it to me, “Basically, I had an affinity of perception, or vision” with environmental analysts. After the ICLEI meeting, Ana-Maria requested a transfer into the city environmental office. She found the unique style of thinking engaging, realizing that it allowed her to tackle challenges that transcended institutional and international boundaries all while working at the local level.

In her new role as a policy analyst for the Secretary of the Environment, Ana-Maria had been instrumental in redesigning BHTrans, the municipal bus system. Creating a public transit network with limited resources poses a choice for municipal governments: should the system

serve to facilitate transportation within heavily trafficked downtown areas, or should they seek to connect those areas to outlying neighborhoods which may not have as large a rider-base? The former option is economically safer, but the latter holds the potential of increasing the number of riders and linking neglected peripheries to urban centers. Compounding this socioeconomic choice is the technical challenge of creating and maintaining a bus fleet that can handle worse road conditions in the peripheries. In the early 2010s, Belo Horizonte ambitiously opted to expand BHTrans, ordering a new fleet of lightweight buses which would more efficiently climb the Mineiro hills. Suddenly, the noise and shudders of the bus made more sense. These were buses stripped to their bare essentials, still smelling of fresh metal and plastic. As if to drive home the message of their proud "modernity," each of the buses bore an image of the *Cidade administrativa* (fig. 18). Belo Horizonte's efforts with BHTrans were rewarded. Attending a session of the global EcoMobility Alliance at the 2018 ICLEI (formerly the International Council of Local Environmental Initiatives) meeting in Montréal, I was startled to hear a South African representative mention BHTrans as an exemplar of innovative transportation. As a prime example of Silva's vision for a transversal environmental action, the city had taken actions both to reduce greenhouse gas emissions and socioeconomic inequality.

Figure 18: Image of the Cidade Administrativa on a Belo Horizonte bus.

Ana-Maria and her colleagues had been instrumental in creating the renewed bus system. Yet for all of BHTrans' sociotechnical ambition, I was surprised when Ana-Maria told me, "I don't need to have a deep knowledge of engineering. I need a deep knowledge of *politics*, to know who to speak with and, eventually, who to include in negotiations in order to make these things possible." Reforming BHTrans had involved a series of collaborative meetings with engineers, urban planners, community groups, and labour unions. The knowledge upon which Ana-Maria drew was thus not her own expert understanding of engineering or city planning, but rather a practical understanding of collaboration. This is Silva's vision of a transversal institution. Rather than seeking authoritative mastery of the environment, Ana-Maria produced a situation where communication between these diverse groups allowed for the emergence of a novel sociotechnical solution which addressed both the global climate and local inequalities.

The state *Plano de Energia e Mudanças Climáticas* (PEMC), the document for government efforts to address climate change, utilizes "transversality" in the same way. Rather than presenting environmental governance as a direct translation of knowledge into practice, the "transversality" of the PEMC instead seeks to foster collaboration with non-environmentally focused sectors of the Mineiro government. This is stated explicitly at the outset of the document:

> Transversal actions seek to guarantee the institutional and governmental coordination adequate to effectively mitigate and adapt to climate change in Minas Gerais. They also seek to amplify international and national cooperation to find new sources of funding, support the creation of an observatory, a consolidated information platform, and to seek more precise information to support decision making *(Fundação Estadual do Meio Ambiente* 2015b, 7).

These transversal tools included a weather monitoring observatory, online resources for sharing municipal funding sources and effective strategies, and an increased commitment to multi-sectoral and international collaboration. Here, we can see again the clear significance of

knowledge, but understanding these "transversal tools" in light of the term's history highlights the pragmatism of knowledge. No singular expert or particular institution has mastery over this information. Environmental action is not justified because it is scientifically mandated, but science works in the service of action.

As one programmer for the state climate data platform explained to me, the information comes directly from the users themselves. We were discussing a new initiative to make a vast array of geospatial data available to the general public through a user-friendly online map.[46] By selecting from one or more of dozens of data sets, users could see environmental data mapped onto Minas Gerais. In a public unveiling of the platform, the programmer spent much of his time explaining where the data originated and how it could be used by municipal administrators, public interest groups, or industries. I was intrigued not only by the promise of transparency of this platform, but also how the data sets themselves were organized into discrete categories. As Geoffrey Bowker and Susan Leigh Star (2000) demonstrated, infrastructural classifications can both inform and shape the ways in which users interact with information. Building on this finding, I asked the programmer about the classifications which included groupings like "vegetation" and "soils" alongside "environmental monitoring" and "environmental education." I was told quite quickly, "they come from the users." The division of categories represented the governmental and private agencies that reported data and were the most likely to use the information. Neither the data nor their classifications were dictated by the programming team.

The information platform demonstrates how the idea of transversality translates into institutional practices. The role of these information-sharing services is not to merely educate users, imagining them as empty containers needing data, but rather to acknowledge them as

[46] This platform is accessible at http://idesisema.meioambiente.mg.gov.br/.

collaborators in a transversal process.[47] The varied sectors of the Mineiro government, alongside non-governmental actors, come together to collaborate without producing a singular, centralized institution. The role of the environmental bureaucracy is not to dictate a *logos* nor to authoritatively direct actions, but rather to produce a real or virtual space wherein this collaboration can thrive.

Conclusion

Transversal environmental ethics remain an experiment. It is still an incomplete response to the climate crisis given the ongoing and persistent challenges. No one would be so audacious as to claim to have developed a formulaic solution that would neatly resolve the issue of climate change. However, this refusal to offer a programmatic solution is precisely the crux of the transversal form of ethics in contrast to the traditional mode of ethical thinking centered on *logos*. There is a strong temptation, widely shared by many in environmental governance and applied academia, to attempt to logically work out the "right" form of discourse which, if only people read and understood it, improvement would follow. Eve Tuck (2009) identifies this as a particular "theory of change" shared by academia, particularly anthropology. We hope that what we write and publicize will improve living conditions by enlightening our audience about the harms endured. This theory of change is simply another version of the *logos*-centered mode of subjectivation discussed by Foucault: the faith that more knowledge will eventually translate into a better life. Transversal ethics takes a different stance vis-à-vis knowledge. As we can see in Ana-Maria's disavowal of knowledge about how Belo Horizonte's buses work or the PEMC's transversal tools delegating knowledge management to its users, knowledge no longer stands as

[47] This approach to teaching is nearly identical to Paulo Freire's methods of *conscientização* which will be discussed in more depth in the following chapter.

the prioritized entry point for environmental ethics even as it remains an important tool. In other words, Ana-Maria's personal ignorance is not an ethical problem so long as the proper expertise finds its proper use.

In conclusion, I would like to highlight two key consequences of this shift to a transversal mode of subjectivation. First, while the environmental analysts in Minas Gerais continue to experiment with transversality, there are reasons to believe that this mode of ethical thinking is particularly well-suited for the horrors of the climate crisis. In a situation where knowledge is less certain, predictions are increasingly difficult, and our practical capabilities are continually in doubt, transversality provides a mode of ethical thinking which helpfully mirrors horror. If we understand horror as a moment when concepts struggle to capture our experiences, or in other words, a moment when "the acceptance of reality becomes a problem" (Flusser 2017, 33), then a mode of subjectivation devoted to non-mastery and innovative collaboration emerges as a potentially suitable response. Rather than "doubling-down" on systems of knowledge that appear helpful but limited, such as complex systems analysis or *socioambientialismo*, transversal environmental ethics appropriates knowledge that can be used unfaithfully, alongside others, to find a line of action that offers an escape from the climate crisis. In the following chapter, I will detail more of the practical instantiations of transversality as environmental analysts sought to enact something "real" to counter the climate crisis.

Second, the shift to a transversal mode of subjectivation away from *logos* poses significant questions for the presumed goals and theories of change of academia. If knowledge is not the starting place of environmental ethics, what does science have to offer? More personally, this is a challenge for my research as well. What do I hope for my research to accomplish if more knowledge is not the solution? For many of the scientists in Minas Gerais, the experiences of

governmental blockages and continual breakdowns produced a kind of humility and self-doubt. The general mood of the office was frequently somber as no one knew if their work would accomplish all that they hoped. However, this form of self-doubt was not borne out of self-depreciation. It emerged from a realistic appraisal of the monstrous scope of the challenges. Transversality reinforces the assessment that no individual person or *logos* will provide the solution to the climate crisis, but it also means that all can contribute to the process. Transversality is democratic in this sense. Silva's vision of a transversal environmental agency does not attempt to manage the environment with a centralized authority, but instead recognizes the irreducible diversity of interests, concerns, and capacities implicit in a democratically and ecologically complex setting. Transversal environmental ethics is a never-ending project, but the advances made in Minas Gerais in the face of the climate crisis demonstrate that even these modest steps offer guidance for a path forward.

Chapter 6: YEARNING FOR REALITY
The Aspirational Realism of Mineiro Geopolitics

"One could no longer distinguish between dream and reality. The structure of reality trembled. Nightmares in one's sleep were less terrifying than the daily news. The acceptance of reality became a problem."
Vilém Flusser, *Groundless*

In nightmarish circumstances where reality itself becomes a problem, where it is easy to feel that all action is futile, what does it mean to *do something real*? In the previous chapter, I elaborated the emergence of a new, transversal mode of ethical subjectivation that engages with knowledge from a dizzying array of domains, weaving them all together without promising mastery or totalization. In this chapter, I will continue to examine Mineiro environmental ethics. Specifically, I show how this transversal mode of subjectivation engages with history, practices, and materials to meaningfully do *something* in the face of the climate crisis.

But how can reality be a problem? I started to wonder after hearing a conference speaker proudly announce, "Welcome to reality." I was at the 2018 ICLEI (formerly the International Council for Local Environmental Initiatives) World Congress in Montréal. This global event served as a meeting place for various regional and municipal governments to discuss climate governance strategies. ICLEI also provided substantial funding and support to the environmental agencies I worked with in Minas Gerais. As a matter of happy coincidence, ICLEI happened to be holding its rotating, quadrennial general meeting in my adopted home city. It presented a chance to return home to Montréal while continuing my fieldwork by following the network of Mineiro environmental science as it reached out beyond state and national boundaries. Traversing these boundaries, climate governance often invokes themes of realism, as when analysts would tell me that they wanted to "do something real." At ICLEI, "reality" indicated a

difference between simulations and "real life" actions that could make a difference in the climate crisis.

The speaker was part of a team of scientists advising world governments on the climate crisis. She was eager to show that the "empty talk" of the past 30 years of climate policy advising could give way to something "concrete." She was not the only one. When talking to other attendees of the ICLEI World Congress, I was struck by the constant barrage of reassurances that this was "real" work as opposed to "empty rhetoric." Even as we milled about the heavily air-conditioned corridors of the *Palais des congrès* during a historic heatwave that claimed up to 70 lives in Québec (Laframboise 2018), the politicians and scientists who attended the global conference seemed optimistic that this gathering of local leaders and environmental advisors would lead to tangible improvements on a wide scale. Perhaps, the meeting was even already one such "real" action in itself.

The ICLEI World Congress's aspiration for realism was only one case of a broader worry in environmentalist movements that awareness of the climate crisis will not necessarily lead to concrete actions. "Reality" or "realism" are key problems for environmental advisors; they worry that actions have not yet been genuinely *real*. In both Belo Horizonte and Montréal, climate advisors always sought to ensure that something "real" would come from their work. The pursuit of "real" action passed through state boundaries and national scales to engage with a diverse set of actors ranging from human institutions to local plants and animals. But what counts as "real" action in the climate crisis, when reality is becoming more and more difficult to grasp? How do climate scientists and regional governments determine whether something is real or has the potential to become real?

It would be a mistake to address the question of reality by turning to the history of philosophical metaphysics or ontology. While philosophy can supply numerous answers to the question of what counts as reality, it would not tell us what the scientists' references to "reality" accomplish in practice because it would assume that "reality" can be known *a priori*. Looking to extraneous philosophical writings to understand contemporary facts is overly discursive and would miss the reasons why advisors are so adamant to make their work real and the consequences of these efforts. What is it about the climate crisis that makes realism difficult? To presume a philosophical definition of "reality," as if it was a settled issue, would miss this challenge. It would not show us the reality of reality itself.

In her study of the fraught relationship between Brazilian labour movements and evangelical Christianity, anthropologist Ashley Lebner suggests addressing "reality" "ethnographically, not analytically as 'ontology.'" (Lebner 2019, 126). By this, she means that "reality" can be understood as a category that significantly shapes experience. This approach contrasts with a philosophical or analytic study of ontology which would begin with an external definition of "reality." The ethnographic study of reality allows Lebner to provide a sensitive account of the disputes between the secular Marxism of the *Movimento dos Trabalhadores Sem Terra* (Landless Worker's Movement) and a messianic Catholic worldview full of salvation and prophecy.

To be clear, treating ascriptions or aspirations of reality as an ethnographic challenge is not the same as denying reality or treating existence as a merely human construction. Doubts about reality presume that there exists something external to the human mind. If we worry that our representations of the world are false, there must be some standard by which they could be judged to be true. In his study of doubt, Vilém Flusser notes that doubt only emerges at moments

where belief is also a possibility. Losing one's "sense of reality" is only possible when experiences of reality challenge mental and social constructions (Flusser 2014a, 6).

For purposes of this chapter, I provisionally understand "reality" in the roughly everyday sense shared by Flusser as an experience of externality and concreteness. When climate analysts express what I call "aspirational realism," indicating that a desired realism has not yet been achieved, the validity of an external reality is never doubted. In this sense, my investigation of aspirational realism, the desire to "do something real" draws on Lebners' ethnographic study of "reality" as well as Eduardo Kohn's realist anthropology (Kohn 2013; 2015). While the existence of the climate crisis is never in question for climate analysts, doubt proliferates in their assessment of their own capacities to address it in a "real" way. I am not offering a systematic ontology or novel description of reality. Rather, I am interested in how realism, that "sense of reality," falters through the climate crisis and how this faltering is taken up as a practical and ethical challenge.

The description of action as potentially lacking the necessary degree of "reality" reveals a central concern for environmental governance. In Flusser's words, the climate crisis is a moment when "the acceptance of reality [becomes] a problem" (2017, 33). The desire to do something "real," this aspirational realism, provides a clear example of what the problematization of reality looks like in practice. As has been demonstrated in previous chapters, the climate crisis evades practical and conceptual efforts to neatly contain its horrors. When environmental advisors speak out against "empty rhetoric" as the opposite of "reality," one might understand these moments as admissions that past climate actions have failed to address the monstrous scope of the crisis. Past actions have been empty rhetoric, but this time, they hope, they are going to do something real. Drawing on my observations of climate advisors aspiring to access "reality" through pragmatic

efforts to ameliorate the horrors of the climate crisis, this chapter will attempt to sketch the contours of this aspirational realism.

Mineiro Localism

What was "real" action for Mineiro environmental analysts? Whenever I asked about pragmatic issues like the efficacy or impact of their work, the analysts always responded with variations of the same answer: "Local! You have to go local." The insistence that action had to be local, beyond all else, continually reemerged. "Real" action was local, and the "real" consequences of programs had to be evaluated by local municipalities. The decentralization of action is a primary tenant of the *Plano de energia e mudanças climáticas.* It trusted the capabilities of local municipalities to enact, enforce, and evaluate proposals.

"Locality" and "Reality" seemed to be practically and conceptually linked, so what precisely was meant by "go local?" Through our conversations, it became clear that local, real action amidst the climate crisis reconfigured Mineiro histories of materialism and ethics. Examining the Mineiro construction of locality as it integrates land and community will clarify the form of realism emerging in environmental governance.

The concept of locality has been frequently discussed both in anthropology and in Mineiro politics. As historian Roderick J. Barman explores in his study of the formation of the Brazilian state, localism played a key role in the Portuguese rule of South America and the uneven emergence of a national identity. Brazil's massive size and geographic boundaries hindered the creation of the "imagined communities" that characterized European state-formation (Barman 1988, 12, discussing Anderson 2006). These geographic limitations to state formation included more than the dense Amazon Rainforest and the Serra da Mantiqueira which

surrounds Minas Gerais. Sailing a boat from the Portuguese colonies in northern Brazil like Belém to the colonial centers in Rio de Janeiro meant crossing through the Southern Equatorial Current which reaches westward across the Northern border of Brazil. This difficulty of navigating this oceanic system effectively limited naval transportation to much of Southern Brazil, including Minas Gerais.

In response to these challenges to transportation, the Portuguese empire granted increased autonomy to its military officials to enforce rules at their own discretion. The result was an imperial order that relied on decentralized "captaincies" (Barman 1988, 21–22). Written records show that Portuguese settlers often identified more strongly with these captaincies than with any form of national project. Thus, when "Brazil" emerged as a general designation for Portuguese holdings in South America, it "did not yet denote a discrete society, one with a distinctive culture and separate identity existing within clearly defined territorial boundaries – in short, a potential nation-state. […] In its precise sense, '*o Brasil*' referred to the Estado set up in 1549 containing the captaincies […] under the oversight of the viceroy at Rio de Janeiro" (Barman 1988, 27).

Anthropologists interested in the concept of locality would perhaps be unsurprised to learn that the politico-geographic structure of the nation-state did not provide a realistic portrayal of early Brazilian self-understandings. As Marilyn Strathern has argued, the transplantation of European concepts of society and statehood onto non-European contexts can easily erase Indigenous forms of sociality (1990, 3). Likewise, Arturo Escobar (2001) argued that the erasure of local "places" in the interest of a universalizing, capitalist "space" demands that anthropologists return their attention to the local "place making" practices of marginalized communities. Anna Tsing also confronts the political ramifications of these universalizing

practices of colonialism and capitalism by imagining the relationship between the global and the local as one of "friction" (2004).

The Brazilian assemblage of captaincies shows that even colonial structures are liable to be transformed by their engagements with local settings. While other European states were concerned with strengthening the legitimacy of a unified sovereign state within a well-defined territory (Foucault 2009), the Portuguese imperial holdings in Brazil represented a much more fractured form of sovereign power. Members of the Brazilian captaincies did not generally understand themselves to be Brazilian citizens or members of a Portuguese culture. This trend was especially pronounced in regions like Minas Gerais that hosted a stronger military presence due to its valuable mineral deposits (Barman 1988, 27).

Rather than connections based on official, national, or imperial designations, many settlers in Brazil associated themselves with networks called "*pátrias.*" Derived from the Latin "*patria*" that is now sometimes translated into English as "fatherland," the Roman conception of the *patria* served to distinguish between the full scope of the *imperium* and the sentimental attachment to the Italian peninsula (Isayev 2017). In Brazil, the *pátrias* functioned like extended yet physically emplaced kinship networks and the "visible, physical community in which an individual was born, brought up, married, pursued a living, and raised a family" (Barman 1988, 26). Laden with strongly heteronormative commitments, connections to the people and place of the *pátria* frequently superseded broader forms of nationalism in Portuguese South America.[48]

[48] "Patria" is etymologically linked to "patriotism." Formally speaking, one could thus distinguish between "nationalism" and "patriotism" as the allegiance to the nation versus allegiance to the *patria*. However, given the disuse of "*patria*" in contemporary speech and the general usage of the two terms as synonyms, I will not use the term "patriotism" as a stand-in for an allegiance to the *pátria.* Perhaps a neologism, "*pátriatismo"* would be more appropriate, but I have not followed this strategy as it is a near homophone with "*patriotismo*."

The gulf between *pátrias* and the nation exploded in Minas Gerais during the *Inconfidência Mineira* [Mineiro Conspiracy] of 1788-89, an event that is still broadly celebrated in Minas Gerais today (fig. 19). After the Portuguese monarchy attempted to compensate for falling mining profits through additional taxes on Minas Gerais, a group of wealthy Portuguese conspirators launched an independence movement. Many of the conspirators had been educated at University of Coimbra in Portugal and all had been inspired by the liberal political philosophies of the recent American Revolutionary War. However, unlike the liberalism of the American or French revolutionaries that sought to create new nations, the Mineiro conspirators openly rebelled in the name of the Mineiro captaincy's *pátria* (Barman 1988, 31).

Figure 19: The 1789 flag of the *Inconfidência Mineira* (left) and the current flag of Minas Gerais (right) adopted in 1963. The Latin slogan translates to "Freedom, albeit late."

While the *Inconfidência* was swiftly defeated by the Portuguese empire, it contributed two important elements necessary for understanding contemporary Mineiro constructions of "locality." The first is that the *Inconfidência* clearly demonstrated the incompatibility of nationalism with a commitment to the *pátria*. Even when Brazil eventually became an independent state as the Portuguese royal family relocated there to avoid Napoleon's army in 1808, the *pátrias* remained paramount in regions like Minas Gerais. Efforts to solidify a sense of national solidarity strategically took the shape of extending the concept of the *pátria* to the entire

Brazilian nation (Barman 1988, 51). When the Portuguese Monarchy eventually fell in 1822, it resulted in increased autonomy for the *pátrias* rather than a new nationalistic ethos (Barman 1988, 75). In other words, while the French revolution attempted to liberate the "people" (Foucault 2003) or the American revolution attempted to liberate property-holders (Beard 2004), Brazilian independence attempted to liberate the *pátrias*.

The second legacy of the *Inconfidência* is the central role that European Enlightenment ideals have played in Mineiro and Brazilian politics for centuries. Many of the state institutions created during the Brazilian Empire implemented liberal ideals of positivism and individual liberties. Likewise, the Brazilian education system drew heavily from the Enlightenment and French Positivist traditions in educating a new class of national elite after independence (Costa 1964). The link between educated liberal rationalism and state formation forged by the *Inconfidência* would later play a large role in shaping the relationship between the Mineiro state and its educational systems.[49]

The conceptualization of land, territory, and community as organized by the *pátria* allows us to better understand what it means for a Mineiro state official to say that "you have to go local." The *pátria*, and as we shall see, localism, depends more heavily on emplaced networks of affiliation rather than abstract grids created by colonial or official states. Conflicts like the *Inconfidência* thus prefigure the distinction expressed by contemporary climate politicians between the "empty rhetoric" of international conventions and the "real" effects of local actions.

[49] This link has been severely disrupted in recent years, as discussed in Chapter 2.

Pátria Environmentalism

The emphasis on the *pátria* informs how "local" action satisfied aspirations for realism in Minas Gerais. This localism shapes environmental care in the region. Many Mineiro citizens have joined local *comitês de bacias hidrográficas* [river basin committees]. These local committees conduct clean-up efforts, ecological monitoring, and political advocacy to care for river sources. Each of the many committees draws members from the communities surrounding the scattered river basins. Despite being staffed by volunteers, the committees work directly with the state via the *Instituto Mineiro de Gestão das Águas* [Mineiro Water Management Institute]. A key site of citizen science (Jasanoff 2003), participation in a basin committee was a common entry point for older members of environmental institutions. Recruitment efforts for the river basin committees often sought to appeal to people's sentimental attachments to the Mineiro countryside via stunning landscape photography or guided hikes through the basins (fig. 20). On these hikes, participants learn about the local vegetation, geological processes, and causes of ecosystem degradation. The river committees offered a way to care for the environment in a way that connected with the *pátria*'s domain of historical attachments to land.

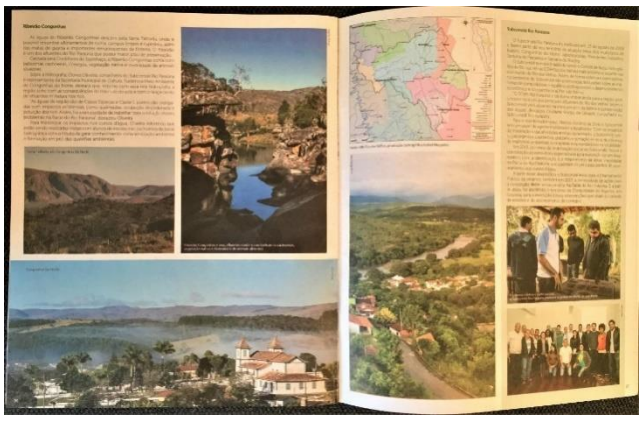

Figure 20: Images from (Comitê da Bacia Hidrográfica do Rio das Velhas 2018)

A focus on personal attachments to the countryside can also challenge environmental policy-making, especially as the climate crisis introduces new forms of environmental danger. This challenge was vividly displayed in Brazil's first major foray into transnational

environmental politics, the 1972 United Nations Conference on the Human Environment in Stockholm. This conference was a milestone in the globalization of environmental politics, producing the United Nations Environment Program, the Brazilian *Secretaria Especial do Meio Ambiente*, and the Mineiro *Centro para a Convervação da Natureza*. On the international, federal, state, and municipal levels, the Stockholm conference reshaped the structures of institutional environmental politics (Starling and Murari 1998, 64; Guimarães 1991, 144).

As recounted by André Aranha Corrêa do Lago, one of Brazil's chief ambassadors to the UN environmental conferences, Brazil's position at the Stockholm conference focused on the importance of economic development for colonized countries, worried that the "developed" nations would push the burden of environmental maintenance onto the countries they had plundered (2007, 120). While joined by a number of postcolonial countries in this position, the international press seized on the image of Brazil as encouraging economic growth over environmental protection and cast it as the "villain" of fledgling international environmentalism (Hecht and Cockburn 2011). Brazil certainly merited criticism for its management of deforestation, but the simplified rendering of Brazil as "villain" can risk glossing over the genuine novelty of the form of politics taking shape in Stockholm and the material challenge it posed to the *pátrias*.

For Brazil, the key debate in Stockholm was the construction of the Itaipú hydroelectric dam on their border with Paraguay. Blocking off the Paraná River approximately 30 kilometers from the Argentina border, Brazil and Paraguay now jointly operate one of the largest hydroelectric dams in the world. Like all hydroelectric projects of such a massive scale, renewable "clean" energy comes at the expense of massive changes to river ecosystems up and downstream. In the case of Itaipú, that potential impact would be felt not only by Brazil and

Paraguay, but also by Argentina, who did not have an official stake in the project. As Christine Folch (2019) notes in her ethnography of Itaipú, navigating these questions of national sovereignty has been an ongoing concern in the management of the dam.

In Stockholm, the dispute came to a head in the question of Argentina's possible right to object to the construction. Despite having no direct territorial sovereignty at Itaipú, Argentinian negotiators argued that they ought to have access to information about and control over an environmental project that would have direct impacts on their territory. Brazilian and Paraguayan negotiators objected (Lago 2007, 138). Ultimately, the dam constructors succeeded at the conference and Argentina was not granted rights of control, but the principles of their objection remain relevant to ongoing climate negotiations. If the materiality of environmental problems transgresses national borders, how do legal mechanisms based on national sovereignty respond? Within frameworks like the *pátria* or the classical nation-state, the answer up until now has largely been to deny responsibility. Local settings replete with personal networks superseded international concerns. While intimate, the geographic reach of the *pátria* did not extend across borders.

In debates over the management of the Amazon rainforest, Brazil's military dictatorship likewise responded to global environmental concerns with assertions of local sovereignty (Hecht and Cockburn 2011). Its anxiety that global climate governance would strip Brazil of its sovereignty was justified to an extent. In 1989, French President François Mitterand declared that "[Environmentalism] will result in a loss of sovereignty for some countries, but it has to be done" (qtd. in Hochstetler and Keck 2007, 113). The Brazilian ambassador Paulo Tarso Flecha da Lima reported overhearing that Mitterrand specifically mentioned Brazil as being incapable of caring for its own land (Lago 2007, 156). News of this comment sparked outrage in Brazil, with

the *Jornal do Brasil* announcing that "Mitterand Wants Countries to Renounce Their Sovereignty" (qtd. in Hochstetler and Keck 2007, 113).

Yet by the 1992 Rio de Janeiro Earth Summit, the newly democratic Brazilian government had shifted its approach to approximate the Argentinian position. As Lago explains:

> The question of sovereignty passed from an instrument that granted the government the legitimacy to do whatever it wished within its national territory to a principle that ought to be used when threats emerged to a democratic regime. Brazil started to admit that what occurred within its territory could be of interest to other countries but continued to be entirely its own responsibility. (2007, 166)

International pressure and Brazil's experiences managing industrial waste in cities like Cubatão in São Paulo (Hochstetler and Keck 2007, 189–202) and Contagem in Minas Gerais (Starling and Murari 1998) taught Brazilian environmentalists that environmental problems were not contained by territorial boundaries. The materiality of pollution, river flows, and gas emissions required a reinterpretation of the duties and capacities of state institutions. It matters whether the objects of environmental governance are solid waste products from industry, liquid flows of hydroelectric dams, or ephemeral fumes of greenhouse gas emissions. This uncontainable materiality has come to be understood as a constitutive part of global climate politics (Aykut and Dahan 2014).

Looking back at the debate over Itaipú, one can see the role of materiality in political practice transforming (table 1). While both the original focus on the pátria and the new focus on transnational flows are material, the political significance of materiality has shifted. The materiality of land and transportation played a significant role in the colonization of Brazil, the formation of the captaincies, and the eventual extent of the pátrias. The materiality of climate politics, however, is fundamentally at odds with this previous materiality. The former sets things in place, the latter sets matter loose; pooling upstream, venting into the atmosphere, scrambling

across territorial boundaries. Both paradigms are material but in fundamentally irreconcilable ways.

The materiality of the pátria is not the same as the materiality of Itaipú or the climate crisis. It would therefore be a reduction to think of the "real" in climate governance as simply the material. One must specify the form of materiality at stake rather than merely rely on the material as a simple foundation for understanding environmental politics. Pheng Cheah (2010) has argued that the Marxist tradition of historical or dialectical materialism has overshadowed "non-dialectical" materialisms such as those presented by Gilles Deleuze and Jacques Derrida. While I am not arguing that these poststructuralist materialisms are preferable over a Marxist tradition, I follow Cheah in remaining open to the possibility to alternative forms of materialism. As he summarizes these alternatives, "The force of materiality is nothing other than the constitutive exposure of (the subject of) power to the other" (Cheah 2010, 81). As these "others" change in particular historical circumstances, the form of materialism changes as well. While materialism is certainly significant, its role in contemporary geopolitics must be interrogated further to understand what it means for the "real" to be "local."

	Pátria (1700s-Present)	Global Climate (1980s-Present)
Form of Materiality	Land, specifically as it poses a limit to transportation and divides up sociopolitical space.	Environmental objects like rivers and emitted gasses whose movements may not follow territorial lines.
Extent of Ethical and Political Responsibility	Care is afforded to primarily to the region and people contained by the *pátria.*	Responsibility is determined based upon globalized consequences of actions.
Role of State Sovereignty	The state protects the autonomy of *pátrias.*	The state mobilizes resources to minimize territorial risks.

Table 1: Comparison of Pátria and Global Climate Politics

Mastering the Land

"Where are you from?" Paulo asked as we walked from our open-plan desks to a room that I had booked to avoid our interview being overheard. "Montréal," I replied, "But I grew up in Minnesota." "Oh, where?" I was surprised. According to an online geography test I had once taken, Minnesota was the single most forgotten state in the United States. I was used to having to explain where Minnesota was to people in Brazil. "Around Saint Paul," I answered. He nodded knowingly. "You know it?" "Yes, on the maps."

Paulo spent a lot of time looking at maps. Composing maps for publication, monitoring maps for environmental licensing, or sometimes, I suspected, just looking at maps for the simple joy of it. When I asked Paulo why he started his career in environmental governance decades earlier, he replied that had always liked maps. As we launched into the interview itself, Paulo explained his joy of maps:

> I've liked my work in environmental licencing a lot, and I'll explain why. It has always been my pleasure to know things. You said that you are from Montréal. I know exactly where you were born, where you live. I know. I can describe the city, the skyline, everything. It's a part of my personality. I like it a lot. Now, working with licensing all these years means that today I spend some time in the North, tomorrow some time in the South, later some time in the *Triangulo Mineiro* [the thin region of Minas Gerais that extends between São Paulo and Goiás]. I know Minas Gerais like the palm of my hand [he gestured to his hand for emphasis]. This pleases me.

Space, knowledge, and pleasure wove together. Within GEMUC, geographic expertise was implicitly gendered, with most of the men of the team having received their initial training in the discipline. When I would ask them about their initial interests in environmental science, I often heard stories similar to Paulo's. As children, they enjoyed looking at maps or satellite images. By contrast, the women of GEMUC who made up the slight majority of the team had a variety of interests that brought them there. Some had studied geography but spoke of it more as a blend of

humanistic and physical science with less of an emphasis on top-down imagery. Others had received training as engineers and took the test to enter the government, looking for stable employment. However, the persistence of the geography-as-mastery narrative among GEMUC's men gives new resonance to Paulo's linking of geographic knowledge to a form of pleasure in mastery.

I do not think that Paulo's insistence that he knew "exactly where you were born" was meant to intimidate me, or at least not intentionally. From his tone, I suspect that he both wanted to show off his geographic knowledge and possibly to make me feel welcome by showing an interest in my home. However, there was a disquieting aspect of Paulo's demonstration of expertise. In her analysis of the gender dynamics of science, Donna Haraway notes that much of masculine science performs a "god trick," presuming a view of "everything from nowhere" (1996, 581). This disembodied and totalizing perspective supports the impression of control, especially inflected with gendered expectations of male control over land and population. As James Scott (1999) has demonstrated, this abstracted geographic perspective has been instrumental in the formation of modernist states, providing a framework for planners to imagine and act upon a complex world.

The connection between control and geography has a name and practice: geopolitics. At its most general, "geopolitics" refers to inquiry into the spatialization of politics and the political management of space. The term derives from a fraught history of European colonization and ultimately as a catchword for the inter-national wars of the mid-twentieth century. Following the Nazi appropriation of the term, many scholars sought to abandon the term "geopolitics" in the 1950s due to its presumed corruption by genocide, machoism, and authoritarianism. However, a new form of geopolitical analysis emerged in the 1970s in response to decolonization

movements and the United States' invasion of Vietnam. Critical geographers began to argue for a spatialized analysis of state power without presuming the end goal of state domination. Geopolitics became critical insofar as it no longer solely concerned the accumulation and control of land, but also an awareness of the spatial positionality of political struggle (Ó Tuathail 1996).[50]

The critical geopolitical tradition permeated work at GEMUC. As demonstrated by Paulo's comments the joys of geographic mastery, these geopolitics remained haunted by the past dangers of traditional geopolitical domination, whereby knowledge is used to exert or imagine control over territory. However, the practice and conceptualization of geopolitics in Minas Gerais also produced novel ways of understanding land, territoriality, and locality. Understanding what it means for the "local" to be the place of the "real" requires interrogating this geopolitical legacy.

Analysts at GEMUC explicitly referred to the nexus of geography and politics in geopolitical terms. Gabriel, another man at GEMUC who had become interested in geography at a young age, suggested that I read the work of the French critic of geopolitics, Yves Lacoste, specifically his 1976 book, *La géographie, ça sert, d'abord, à faire la guerre* [*Geography is Used, First, to Make War*], that was published in Portuguese in 1988. Lacoste attempts to rescue

[50] The critical geopolitical tradition has strongly contributed to a feminist iteration of geopolitics. I am indebted to this tradition, particularly Sarah Whatmore (2002) and Deborah Dixon (2016), for approaching the geopolitical history and potentials of work in Minas Gerais. The feminist geopolitical position emerged out of the critical turn in geopolitics following Yves Lacoste's resuscitation of the term. Building particularly on feminist approaches to materialism (e.g. Grosz 1994; Braidotti 2002), feminist geopolitics counters the abstractions of imperial geopolitics with a focus on the earthly, fleshy, and differentiated materiality of life. In Deborah Dixon's rendering, feminist geopolitics explores much more than gender in a strict sense, but rather as an amplification of feminist concerns about bodies within a critical geopolitical frame. Rather than reinforce the imperialist interests of states, feminist geopolitics emphasizes the actual porosity of boundaries, whether speaking of those between states, between "nature" and "culture," or between individual bodies. The feminist geopolitical perspective is thus eminently open to "feral proliferations," flows of bodies, toxins, or other entities that disrupt geopolitical boundaries (Tsing, Mathews, and Bubandt 2019).

geopolitics from those like Adolf Hitler and Henry Kissinger who saw geopolitics as a *Realpolitik* intent on national domination. Lacoste's objective was not to defend the study of geography as an apolitical, disinterested study that had been tainted by geopolitical distortions. Rather, Lacoste grounds geography in geopolitics, asserting that geography, like any study, was motivated by particular interests and conducted in conjunction with forms of power (2013, 56). Lacoste's objection is not the politicization of geography, but *what* or *whose* interest geography serves.

Approaching geography as a geopolitical strategy demands reconceptualizing the basic terms of geography. Lacoste's primary target in this regard is the concept of a "region" which originated in the work of the nineteenth-century French geographer Paul Vidal de la Bache. Vidal proposed studying "regions" with a holistic method of relating physical geography to cultural "*genres de vie*" [lifestyles]. Lacoste critiqued this "Vidalian" framework by arguing against the idea that dividing space into distinct regions was inevitable for geography. Lacoste argues that Vidal's focus on "regions" as a unit of analysis for lifestyles reified administrative logistics (2013, 155). Furthermore, regionalization gives way to the illusion that phenomena that occur in one region have a limited impact on other regions. Lacoste worried that

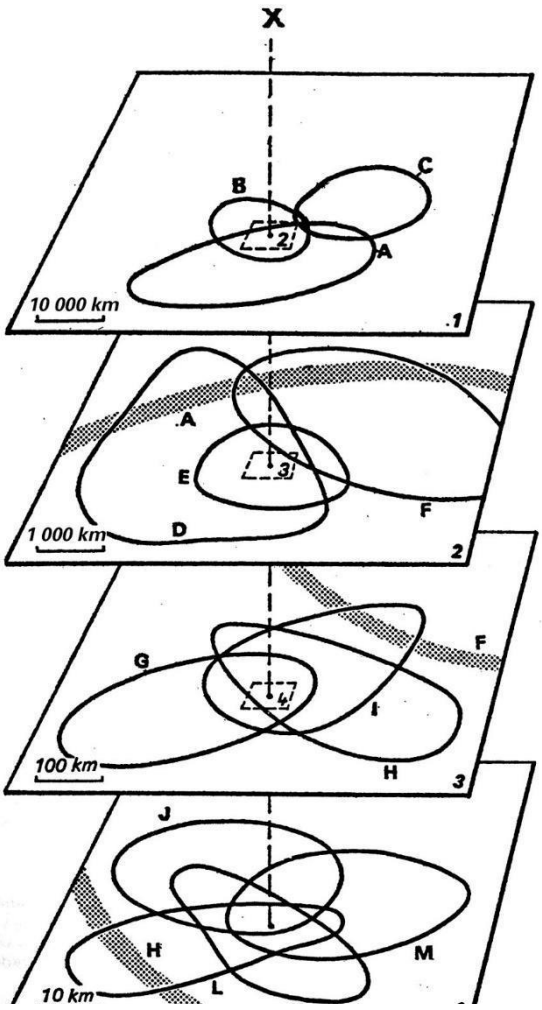

Figure 21: A diatope from Lacoste, 2013

regionalization thus barred a better appreciation for dynamics that crossed spatial scales (2013, 107–13). In place of a regional atlas, Lacoste proposed a multitiered "diatope" (fig. 21). Named for the etymology of *dia* (through) and *topos* (place), diatopes mapped singular points in space as a line that transversed multiple planes of varying spatial scales. Different methods of dividing space could be applied at any of the levels to call attention to the dynamic consequences of eco-regions, geological formations, or national borders. In this way, the smallest scales and the largest scales can be seen to mutually affect each other.

For GEMUC, *La géographie, ça sert, d'abord, à faire la guerre* provided license to think geopolitically free from geopolitics' associations with past imperial projects. Rather than see the world as divided up into sovereign territories waging wars of expansion, Lacoste provides a model of viewing the globe as an assemblage of various actors negotiating concerns for a shared environment. As Gabriel explained to me, this geopolitical lens transformed physical environments into points of interest that exceed formally given political domains: "Why are certain governments or certain nations interested in territory that is not – that exceeds their borders, that is not within their sovereignty? Why do they decide to intervene there? What do they want? What is the interest in the natural or human resources there? What is the interest?"

The image of the world that emerges from Lacoste, at least for Gabriel, bears many similarities to the Argentinian position negotiated in Stockholm. States are not solely contained by their borders because they have a deeply material existence. States exist on land and waters, but these materials are not wholly contained by the state. Air, water, pollution, and other materials flow through and beyond territorial boundaries. Acknowledging this materiality reshapes understandings of the state. No longer a romantic representation of the will of the nation or guardian of the *pátria,* the state morphs into an instrumentalized apparatus that transversally

marshals power within a concrete setting, a tool that can be used by members of the executive branch to directly intervene in an environmental crisis.

To recap: from the desires of climate politicians at ICLEI to the worries of GEMUC analysts, there is a concern among those working with climate change that their work be "real" rather than empty talk. Some suggested that to be "real," work had to be "local." At least in Minas Gerais, what it means for action to be "local" is informed by the history of Brazilian colonization and the formation of the *pátrias.* However, this meaning of locality encountered a barrier in late twentieth-century environmental concerns, such as the Itaipú dam construction, which compelled environmental governance to increasingly look beyond national administrative borders. A new form of geopolitics now seems to be emerging, one that remains haunted by the authoritarianism and militarism of imperialist wars while also gesturing towards a material domain that transgresses the nationalist political imaginary. Of course, whether or not a state institution like GEMUC can ever escape the specter of state violence harboured by geopolitics is a matter for debate. However, the incomplete and tenuous construction of new forms of geopolitical action attempt, always unsure of themselves, to forge a "real" connection between democratic politics and local earth.

For the remainder of this chapter, I will explore two particular ongoing projects that offer a promise of doing something "real" while engaging with the local histories and materials of Minas Gerais. The first is the educational programs of *conscientização* (consciousness-raising) and *capacitação* (capacity building) that sought to provide alternative modes of subjectivation by enlisting individuals directly into addressing the global climate crisis. The second project, Ecosystem-Based Disaster Risk Reduction (ECO-DRR), was a joint project by GEMUC and sections of the military to utilize the ferality of the Mineiro landscape to respond to

environmental disasters. Both of these projects reinterpret the legacy of Mineiro environments by trying to create "real" action on a "local" level through an intimate relationship with geopolitical materiality.

Conscientização (consciousness-raising) and *Capacitação* (capacity building)

Alongside their official work with environmental licensing and regulation, GEMUC and other subsections of the secretary of the environment organized training sessions referred to as either *"capacitação*" ["capacity building"] or *"conscientização"* [conscientization" or "consciousness building"]. The sessions typically took the form of brief presentations for audiences of municipal government employees, representatives of unions and other industrial organizations, or local activists concerning the basics of environmental science and adaptation or mitigation efforts. On any given day, one or more of the small team of climate scientists I worked with would be traveling somewhere in the state to deliver one of these presentations. During the sessions, they sought to link the global issues of climate change to local concerns about "real" action. Topics could range from adapting agriculture to droughts or preparing public health officials for disasters. At a time when institutional and material support for climate science was rapidly crumbling, the modest scope of these educational activities apparently offered environmental analysts a promising avenue for action.

While I initially understood *conscientização* as a buzzword or jargon to refer to educational work, it has a deceptively intricate history in Brazil. The term famously entered Brazilian academic circles through the work of the educational theorist Paulo Freire. *Conscientização* is a central theme of Freire's work, signaling his unique approach to collaborative and non-authoritative pedagogy. Freire's work countered the so-called "banking

model" of teaching that envisions knowledge as a resource stored in the mind of the teacher and deposited into the minds of the student. Freire instead argued for pedagogy that guides students to engage with their experiences to develop a critical awareness of their worlds and the potential utility of the lesson's content, whether it is something as complex as mathematics or as routine as literacy. He calls this process of fostering and nurturing critical awareness "*conscientização*" (Freire 2000).

While Freire popularized the term in Portuguese, he did not invent the term himself. He drew the term from the French-Martinican philosopher Frantz Fanon who, in his philosophical memoir *Black Skins, White Masks* (1952), refers to the process of aiding a therapeutic patient to "*conscienciser,*" or render the unconscious explicit. In the colonial context, this process was meant to prevent "hallucinatory lactification," the self-identification with the white colonizer. Instead, the subject of Fanon's therapy was guided to "act towards the modification of social structure" (1952, 80). In the context of Fanon's work, *conscientização* operates to prevent the incorporation of a racialized schema into Black self-consciousness by directing attention outwards towards the historical, political, and material forces of anti-Blackness. Understanding *conscientização* in this context provides us with insight into Freire's decision to adopt the term as a key goal in his liberatory pedagogy and, ultimately, its use as a response to the aspirations of realism in climate politics.

Following Fanon, Freire situates *conscientização* as a process that guides a participant towards a more immediate interaction with reality along with a recognition of their agency. *Conscientização* is as much about self-transformation as it is about learning about the world. As Freire states, "critical consciousness," the goal of *conscientização*, is characterized by an "integration with reality" [*integradaçaõ com a realidade*] (1968). Rather than superimposing an

external framework onto an audience, *conscientização* dialogically builds towards this integration with the students.

Eve Tuck and K. Wayne Yang critique Freire and Fanon's concept of *conscientização* in their article *Decolonization is Not a Metaphor* (2012). They argue that an overemphasis on ostensibly decolonial "conscientization" in fact permits settler academics to dodge the material core of decolonization: land repatriation. In other words, *talking* about decolonization comes to replace *real* decolonization. When I first encountered the term "*conscientização*" during fieldwork, I was also concerned that it was yet another moment of passing responsibility for "real action" to someone else. However, while Tuck and Yang's critique of the metaphorization of decolonization in general is strong, their reading of Freire and Fanon simplifies the concept and thus may lead to confusion about the project of *conscientização* in Minas Gerais.

Conscientização is not merely an application of the banking model of education. It is a transformation of the process of education itself. Its starting point is engaged dialogue with students that incorporates their lived experiences with the end goal of allowing them to actively participate in that reality. Tuck and Yang's image of *conscientização* is merely a moralized version of Freire's "banking model," presented as a superficial "guilt-tripping" campaign that passes from sanctimonious speakers to an unaffected audience. This confusion strips Freire's *conscientização* of much of its force and specificity.

To demonstrate the capacity of *conscientização* as a mode of education that relates to reality, I will discuss one particular presentation by a member of the Mineiro federation for agriculture and livestock. To an audience of other members of the environmental bureaucracy, union representatives, educators, activists, and others who attended the public event, she detailed an outreach program intended for "*Produtores rurais*" [rural producers], a broad category that

includes farmers, ranchers, and miners. During the drought, rural production statewide had stalled as crops dried up and the mines ran out of the water required for the extraction process. The speaker highlighted two key facts: with global climate change already present and expected to intensify, the world *will* change, but also "*a gente pode mudar*." People can change too.

Linking the two poles of world and human transformation is the core of *conscientização*. Rather than assuming a static human condition that will simply be swept aside by climate change or finally overcome "nature" through technology, her presentation began from a point where human beings as selves and communities are mutable, capable of profound changes that would make the future calamities livable, albeit in a radically different way. To underline the transformative potential and demand of the climate crisis, her presentation included an image of Pope Francis. In a speech bubble emerging from a photo of him waving, she quoted *Laudato si'*, his 2015 encyclical on climate change. The selected passage described climate change as an "ethical, cultural, and spiritual crisis of modernity" (Francis 2015). While actual religious practice in Brazil varies, the use of the Pope's image carries particular weight in a country where nearly two-thirds of the population describe themselves as Catholic. The goal of the image and the presentation as a whole was clear: to engage the economic and religious components of rural Mineiro life to enroll rural producers into caring about climate change and to be open to transforming their lives to address the problem. This model of change through dialogical education enacts Freire's concept of *conscientização*.

But if *conscientização* is dialogue that aims to transform the participant into an integrated and active part of "reality," what is the "reality" that the outreach program brings to its audience? The presenter summarized the issue succinctly with the repeated motto: "*Produtores rurais são produtores de água*" ["Rural producers are water producers"]. The identification of the established category of "rural producer" with the neologism of "water producer" indicated the degree of integration the presentation envisioned. The presenter illustrated her point with images of the earth's hydrological cycle (fig. 22). Presenting the global water supply as a relatively closed system where water passes through phases of matter as it moves between the atmosphere, rain, runoff, and water reservoirs, she emphasized the continual movement of water. For agriculture and mining to function, she argued, this cycle needs to continue. However, she stressed that changes in global temperatures and local activities disrupt this cycle, locking water in place. Contaminated water cannot be used for agriculture, and water used up in industrial processes does not flow back into the system to replenish groundwater.

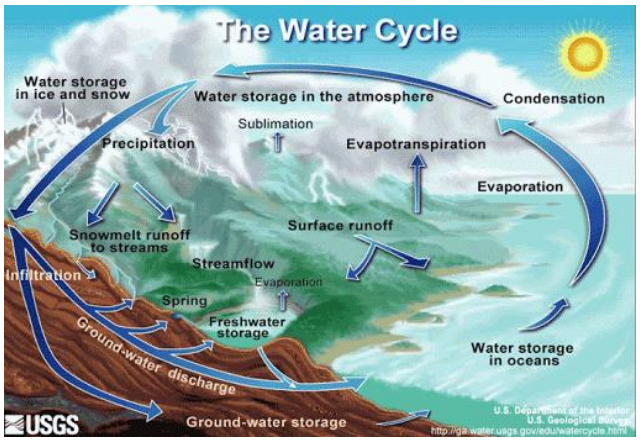

Figure 22: Image of the hydrological cycle used in conscientização presentation. English captions were included in original presentation.

The identification of rural production with water production was not a metaphor. The goal of the presentation was not just to communicate particular pieces of environmental science. Rather, the goal was to bring rural producers to understand themselves differently: as water producers. If rural production could be understood as a constituent element of the hydrological cycle, the hope was that more responsible water management would result. This goal perfectly

encapsulates Freire's method of *conscientização.* Through the support of a teacher, rural producers were led to see themselves as active participants in a global reality.

Ecosystem-Based Disaster Risk Reduction

After the Mariana dam collapse,[51] toxins from mining waste soaked into the flooded riverbanks, poisoning the people and landscape. The devastation exceeded merely physical damage to the town of Bento Rodrigues and the other communities along the Rio Doce. Including both the human lives lost and the fish, sacred to the Krenak, killed during their vital spawning season, the damage of the dam collapse is perhaps impossible to fully quantify. Like many of the coming disasters of the climate crisis, the monstrous scope of the disaster poses a significant challenge to understanding how to respond.

It was not obvious that GEMUC, an office dedicated to climate change and energy transitions, would have anything to do with the disaster response. Other sections of the environmental bureaucracy were directly dedicated to industrial waste management. Others were dedicated to mining specifically. Still others were dedicated to questions of security and legal action, all of which had a direct stake in the ensuing discussions. I was thus surprised when I found that a large portion of GEMUC's work was dedicated to the Rio Doce.

It was not inevitable that the mining disaster be handed over to the Secretary of the Environment. Homicide charges filed in 2016 against the executives of Samarco and its parent companies could have signaled a shift towards thinking about the disaster primarily as a humanitarian crisis or primarily the responsibility of the industrial organizations. Instead, the disaster on the Rio Doce joins other incidents where mining companies have rhetorically framed

[51] Discussed in greater detail in Chapter 1.

their failures as "natural" occurrences whose harms will naturally fade away over time (McEachern 1995). By placing their failures in the realm of "nature," mining companies shift culpability away from human agents, who can be held publicly or legally accountable, to the natural environment which can only be cleaned up. The very fact that the Secretary of the Environment was tasked with clean-up, rather than the mining company itself or the federation of industries, reflects a lack of institutional power directed towards holding the perpetrators of the damage responsible.

Despite this ominous atmosphere, GEMUC's management of the Rio Doce came about informally, with "just a conversation." The most significant way to break through the rigid bureaucratic gridlock of the workday happened every day during lunch. For half an hour, workers from around the *Cidade Administrativa* congregated in one of the half-dozen cafeterias scattered in the complex. Over buffet counters and at lunch tables, workers from different sections of the government had an opportunity to chat about the day with members of different administrative sections. At times, these informal conversations and friendships would lead to formal links that transversed the structures of bureaucracy. Following the Brazilian anthropologist Roberto DaMatta, people referred to these moments where informality gave way to governmental action as "*jeitinhos*," roughly translated as "little ways," that worked through the cracks in the formal rules to find a path forward (DaMatta 1999).

One such *jeitinho* emerged between a climate analyst and a member of the Department of Civil Defense, the section of the Military Cabinet responsible for disaster management. This was an unlikely alliance. Throughout the dictatorship, sections of the military, including civil defense, had been actively opposed to the growth of environmentalist movements. Instead, the military prioritized economic and industrial development even if it conflicted with environmental

protections (Hochstetler and Keck 2007; Pereira and Faria 2010). The alliance between GEMUC and Civil Defense that emerged in the late 2000s was unexpected but necessary to navigate the fraught terrain between the two institutional cultures.

For its part, Civil Defense has had a growing interest in climate change, especially following the recommendations of the 2015 United Nations Sendai Framework for disaster risk reduction. As one member of Civil Defense explained to me in an interview, the continual prerogative of civil defense has been to create a "culture of security" [*cultura de autoproteção*]. Above all else, this project meant working locally to materially and culturally create the conditions that minimized vulnerabilities to disasters, whether stemming from an epidemic, violence, or environmental degradation. Citizens needed to be trained to better perceive risks. This could only meaningfully happen at the local, personal, and material levels. Presented this way, Civil Defense ideal of a "culture of security" extends the earlier ideals of the *pátria.* Rather than top-down enforcement, authority engaged with personal networks in physical locations.

GEMUC did not harbour the same goals. Instead, the Mariana disaster offered two opportunities for the climate analysts. First, it offered a glimpse of their potential future in which environmental disaster management becomes a larger concern as climate change continues to unfold. Second, climate analysts were able to use the opening of disaster management discussions to interject with environmentalist ambitions that had so far struggled to find approval among other sections of the government.

GEMUC and the Civil Defense maintained their competing yet non-contradictory priorities as they agreed on a promising new paradigm of disaster management: Ecosystem-Based Disaster Risk Reduction, or "Eco-DRR" for short. To use a brief standard definition, "Eco-DRR is the sustainable management, conservation, and restoration of ecosystems to reduce

disaster risk, with the aim of achieving sustainable and resilient development." (Estrella and Saalismaa 2013, 36) In other words, Eco-DRR uses "natural" processes or objects to alleviate disasters. Eco-DRR is one example of so-called "Green Infrastructure," building projects that rely on a combination of ecological and artificial materials. For example, Eco-DRR projects in Ghana plant and maintain mangroves along the coast to stabilize the shoreline and defend the biodiversity of coastal ecosystems (IUCN/PACO 2016, 36).

To rehabilitate the Rio Doce, GEMUC and Civil Defense worked with local municipalities to plant local grasses along the banks of the river. Quick growing and sturdy, the roots help to secure the river banks to prevent future erosion and to remove toxins from the water. Furthermore, properly managed ecosystems may reduce the need for extensive maintenance typically associated with "grey" infrastructure like concrete levies.

For now, these projects are still being trialed by municipalities, and results of these tests are still forthcoming. Nonetheless, Eco-DRR has been one of the greatest sources of optimism for analysts at GMUC based on the success of similar projects abroad. This optimism undergirds the sense that Eco-DRR may be something "real" to be done about the climate crisis.

Eco-DRR, beyond serving as a bridge between government departments, offers a shortcut to living with a disastrous environment. In a paper discussing the potentials of reforestation as a means to meet the demands of the Paris Climate Agreement, members of GEMUC argued that the most cost-effective means to restoring damaged ecosystems was not, as one might expect, to simply plant trees, but rather, to "remove the barriers" to "spontaneous, long-term ecological processes" through "Assisted Natural Regeneration." (Nunes et al. 2017) This strategy relies on the abilities of plants and ecosystems to self-propagate to reduce the need for active oversight from people. This same "spontaneous process" lies behind the cost-effectiveness of Eco-DRR.

Once the plants take root on the river bank, they become an active part of the maintenance of water quality and ecosystem resilience. Rather than relying on human oversight, Eco-DRR lets the spontaneous processes of plants take over ecosystem management.

Understood in this way, Eco-DRR is less of an effort to impose a human design on a natural world than it is a new configuration of humans, plants, waterways, and ecosystems that draws upon the capacities of all to support the wellbeing of all. In Guattari's terms discussed in the previous chapter, Eco-DRR maximizes "the coefficient of transversality" between these different actors to bring about a new form of survival. The ferality of the climate crisis appears both in the dangers of natural disasters, but also in the more congenial capacity of plants to reduce vulnerabilities and repair damage. The use of Eco-DRR as a response to disasters shows that new modes of interaction with ecosystems are possible beyond the binary divide of nature and culture.

Conclusion

After *conscientização* sessions, I often asked analysts how they thought it went. After a frequently enthusiastic description of the audience and the discussion they may have had, I would ask, "Will this make things better?" or "Will this lead to real change?" They would sigh. Sometimes that was all the answer I would get. Other times, I would be told that we would need to wait and see, or that only the local municipalities had access to that kind of data. While *conscientização* sought to weave ethics and local materials together into a new form, their search for realism remains aspirational, longing for confirmation.

Neither *conscientização* nor Eco-DRR guarantee survival through the climate crisis, but both offer a chance of doing something "real." Both engage seriously with local settings, either

in terms of connecting with particular audiences or particular ecosystems. Both are materialized, albeit in different ways. While Eco-DRR's materiality is varied, drawing on plants, people, rivers, and their interactions, *conscientização* differentiates itself from other forms of education by its insistence that all its participants must be integrated with a material reality.

Compared to previous forms of environmental politics in Minas Gerais, these new geopolitical strategies extend and modify older commitments. The legacy of the *pátria* lives on in the localism and materiality of these new strategies. However, the transversal ethos of climate analysts has potentially undone the parochialism that hindered environmental negotiations in the twentieth century. Instead, climate analysts have successfully connected Mineiro localities to issues of global concern. In so doing, they have not only transversed different scales, but also the divisions between bureaucratic structures, authoritarian hierarchies, and the divide between human beings and other forms of life.

However, both Eco-DRR and *conscientização* remain aspirational. They have not yet proven that they produce "real" results. Eco-DRR programs are still in pilot stages. Whether they succeed or fail will only be ascertained through the course of future environmental disasters, and even then, mitigation can only be compared to a hypothetical alternative. The "real" consequences of *conscientização* are determined by the actions of the participants. However, climate analysts rarely have the means to follow up with participants to evaluate program efficacy. Despite these issues, these projects promise hope because they mirror the chimeric nature of the climate crisis with their own transversality. The horrors may be ever-changing, but at least these strategies acknowledge that volatility.

Conclusion: *NEITHER HEROES NOR MYTHS*

At the end of my stay in Brazil, the rolling hills and hollowed out mines of Minas Gerais glided past the bus windows on the almost 9-hour ride from Belo Horizonte to São Paulo. Just before entering the Mantiquera mountains that mark the border of Minas Gerais, the metropolitan area ended with one last cluster of towering apartment buildings. Scrawled in massive letters on one was the graffito: "*Não precisamos de heróis nem de mitos. Apenas de novatos que ouçam nossos gritos!!!"* [We don't need heroes or myths / Just novices who listen to our cries!!!] (fig. 23).

Figure 23: Graffito (Duduzinho Monteiro 2018)

An end to myths at the end of fieldwork. Within the Brazilian media, "*O mito*" ["The Myth"] was a nickname given to presidential candidate Jair Bolsonaro by his supporters. It evoked the exaggerated portrayal of Bolsonaro as a hyper-masculine authority figure, in contrast to the aging Lula and Dilma Rousseff, Brazil's first female president. The title equally referred to the mythical quality of Bolsonaro's appeal to the Brazilian electorate. In his regular broadcasts on social media, the former army captain waxed poetic about the supposed peace and glory of the 1964 to 1985 military dictatorship. Over three decades later, memories of the violence of the dictatorship had faded, and Bolsonaro could promise to heroically return the country to a time

when, so the myth goes, there was no corruption, no violence (except against those who deserved it), and plentiful resources for all. "The Myth" promised to be the "Hero."

The graffitied renunciation of mythical heroes are lyrics from the rapper MV Bill's "*Ficha Suja* [Dirty Token]," released in September 2017. In the music video (Brehm 2017), these lines are accompanied by flashes of illustrated figures in stress positions while MV Bill parodies a military salute. The name "Bolsonaro" briefly flashes over the word "*mitos*" (fig. 24). The full stanza of *Ficha Suja* continues:

Figure 24: Stills from (Brehm 2017, 2:44)

Não precisamos de heróis nem de mitos	We don't need heroes or myths
Apenas de novatos que ouçam nossos gritos	Just novices who listen to our cries
E analise a puta crise federal,	And analyze the fucking crises
Financeira e social, política, ética e moral	Federal, financial, social, political, ethical and moral

This was not the first time that MV Bill had disparaged mythology. In a 2005 book *Cabeça de porco* [Pig Head], coauthored with his frequent collaborator, the activist Celso Athayde, and the anthropologist Luiz Eduardo Soares, the term "*mitologia*" appears only once. Discussing the "depressing" condition of Rio de Janeiro's *favelas,* the authors note:

> In song and verse, they sing about a cheerful and festive mocking version of Brazil which finds spaces of happiness in the middle of misery with football and *sambe no pé*. Not

> everything is fantasy and folklore, or this mythology of tupiniquim[52] hedonism, but the moment demands a little more care in generalizations. Celso's grave words bear repeating: depression dwells in the *favelas*. We are speaking of de-press-ion [*de-pres-são*]. The term is strong, the reality painful. We all know what it means. Psychic despondency contaminates the body, inhibits initiatives, ruins hopes, strengthens fear and imposes restraints. No more folklore. Let's recognize and treat this pain. (Soares, MV Bill, and Athayde 2005, 283n2)[53]

Mythology in this rendering sanitizes Brazil, using the spectacle of dance and sports to conceal its painful reality. For the authors of *Cabeça de porco*, recognizing reality demands rejecting mythology and folklore.

As a conclusion to this dissertation, I will take MV Bill's rejection of mythology seriously. What if, in facing the horrors of the climate crisis, we have moved both dramatically and imperceptibly away from mythology? Not only particular myths, like the heroic potential of technology to "save" the world, but away from the structure of mythology altogether? Sitting on the bus away from Belo Horizonte and reflecting on my research, I was struck by MV Bill's disavowal of myth, that quintessential object of the anthropology of Brazil since at least Claude Lévi-Strauss. Reading the full lyrics of *Ficha Suja* and *Cabeça de porco* later, I wondered why myths and heroes were set against the novice's analysis of a multifaceted crisis, a form of analysis in which I potentially recognized myself.

There is something potentially obscene in comparing Bolsonaro's myth with Claude Lévi-Strauss's work. After all, Lévi-Strauss fled to Brazil specifically to escape an earlier instance of the violent authoritarianism championed by Bolsonaro. And yet, there is an uncanny

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[52] The term "*tupinuiquim*" is derived from the Tupinuiquim Indigenous people who were among the first groups to encounter Portuguese settlers. The term has since been claimed by the Brazilian settler-state to refer to all of Brazil, rhetorically positioning the state as the inheritor of Indigenous culture.

[53] "*Canta-se em prosa e verso o Brasil zombeteiro, alegre e festeiro, que abre espaços para a felicidade, em meio até à miséria, com o futebol e o samba no pé. Nem tudo é fantasia e folclore, nessa mitologia do hedonismo tupiniquim, mas o momento exige um pouco mais de cuidado nas generalizações. As palavras de Celso, repito, são muito graves: a depressão campeia nas favelas. Estamos falando em de-pres-são. É forte o termo, e dolorosa, a realidade. Cada um de nós sabe o que isso significa. O abatimento psíquico contamina o corpo, inibe iniciativas, arruína esperanças, reforça o medo e impõe retraimento. Chega de folclore. Vamos reconhecer e tratar essa dor*."

resemblance between the myth of Bolsonaro and Lévi-Strauss' study of mythology. As glossed by Anand Pandian, Lévi-Strauss perceived mythology as a unique "temporal structure of anticipation and recognition" (2019, 55). Myth structures the world across time, giving events their own proper place and meaning. More specifically, Lévi-Strauss writes that myths are "timeless" insofar as they do not refer to sequential periodization such as "past," "present," and "future" (1963, 209).[54] Through myth, time receives structure.[55] Myth gives events meaning, significance, or order.

Because of its relationship to time, mythology provides the conditions where "anticipation" and "recognition" are possible.[56] Mythology provides a scaffolding for thought, including scientific thought, whether it is formally logical or not. At its most general, Lévi-Strauss writes, "the purpose of myth is to provide a logical model capable of overcoming a contradiction" (1963, 229). Myth provides a foundation for *logos* in all of its varied forms. This undergirds the appeal of myth when facing an uncertain future. Myth promises that the world is whole and unbroken when experience may indicate otherwise.

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[54] Elsewhere, Lévi-Strauss discusses "timelessness" as characteristic of "the savage mind" whose "object is to grasp the world as both a synchronic and a diachronic totality" (1966, 263).

[55] On a technical level, Lévi-Strauss's analysis of the "timelessness" could be compared to Heidegger's critique of the presentation of history as composed of discrete moments. For Heidegger, this form of experiencing or narrating the passage of time relies more fundamentally on an "ecstatical unity" of "temporality," an ontological structure of time which "stretches" through the process of *Dasein*. Any periodization is merely a particular interpretation of this more fundamental process (Heidegger 1962, 401). In this sense, one could understand Lévi-Strauss's mythical "timelessness" as a moment of insight into ontological temporality insofar as myth strains at the limits of language to exceed the categorization of time. While never referencing Heidegger explicitly, I take this understanding of Lévi-Strauss to undergird Viveiros de Castro's interpretation of mythology, as when he writes (in more Deleuzian language), "Mythic discourse registers the movement by which the present state of things is actualized from a virtual, precosmological condition that is perfectly transparent – a chaosmos where the corporeal and the spiritual dimensions of beings do not yet conceal each other" (2014, 65–66). Within this pairing of mythology and ontology through timelessness, MV Bill's rejection of mythology can be read along the lines of Enrique Dussel's rejection of ontology as "the thinking that expresses Being – the Being of the reigning and central system – is the ideology of ideologies, the foundation of the ideologies of the empires, of the center" (1980, 5). Rejecting ontology implies accepting coexistence with beings who are fundamentally inaccessible (as discussed in Chapter 3). Likewise, to reject mythology would mean to reject the unity of temporality as presented by Heidegger and Lévi-Strauss.

[56] While never explicitly referencing each other, Lévi-Strauss's linkage of mythology and Enlightenment scientific rationality closely mirrors Theodore Adorno and Max Horkheimer's argument (2007), originally published roughly a decade earlier, that the Enlightenment was an extension of mythological efforts to explain and manage the cosmos.

Just as mythology provided an anchoring point for the aspiring anthropologist fleeing genocide, war, and chaos, *O Mito* has emerged as an organizing feature for Brazilians perturbed by the apparent disintegration of their society into corruption, violence, and disaster. Despite the incongruities, Bolsonaro's myth fulfills many of the same tasks as Lévi-Strauss'. Both are means of grappling with the dangerous, the obscure, the unknown. Both are a way of promising that the past had a purpose and the future will have reason.

Given the seductive appeal of myth, why would MV Bill reject it now? Interestingly, MV Bill and the other authors of *Cabeça de porco* also promise "recognition," but through the rejection of myth. The recognition that comes from the rejection of myth is different from that which myth provides. While mythical recognition gives each element its proper place and order, *Cabeça de porco* presents recognition as a confrontation with pain, disjointedness, and "depression." These negative experiences are neither absolved nor explained. The image of the world the book presents is not one of mythological order, but rather of abject disjointedness. The recognition of horror seems to preclude the mythical recognition of the world, one in which history is rendered anticipable and recognizable. As I grapple with MV Bill's call for a non-heroizing, non-mythologizing analysis, I wonder why this seems to be a moment of either-or decision. Why would horror appear to produce an irreconcilable antagonism between structuring myths and abjected reality?

Post-Myth, Post-History, Post-Reason

For Vilém Flusser, shortly after feeling the Brazilian military dictatorship in 1972, myth and horror were also in opposition to each other. Flusser distinguishing three modes of relating to cultural progress (2013, 115). The first is "myth," a mode in which time "has a moral and ethical

function: it sets everything into its proper place" through a cyclical "eternal recurrence within a static space full of values" (Flusser 2004, 117–18). The response to anxiety in mythic time is to *wait* and have patience that trouble will be resolved in due time. The second mode is "historical," in which the production of durable documents of culture and industry generate an impression of teleological progress. "Nothing repeats itself" in history, and "every day is new and singular, and every lost moment is definitively a lost opportunity to comprehend the world and to intervene in it" (Flusser 2004, 118).

Flusser argued that "mythical" or "historical" ways of organizing time and reason were no longer adequate to describe the contemporary world that included the atrocities of the Holocaust and the Brazilian military coup. As he states with characteristic bluntness, "At Auschwitz, all of our categories, all of our 'models,' suffered an irreparable shipwreck" (2013, 5). Any attempt at reckoning with horrors at the level of Auschwitz therefore cannot attempt to "explain" horror through concepts and categories which were themselves complicit in producing those horrors:

> [Auschwitz] springs directly from the depths of culture and of its concepts and values. The possibility to realize Auschwitzes is implicit within our culture from the very start: the Western "project" already harbored it, although as a remote possibility. Auschwitz lies within the initial program of the West, which progressively realizes all of its virtualities as history unfolds. That is why the question that Auschwitz poses before us is not: how did it happen? It serves no purpose to 'explain' Auschwitz. The fundamental question is: how was it possible? Because what is being questioned is not the extermination camp, but the West. Thus one other question: how to live within a culture henceforth unmasked? (2013,5)

If the supposed "progress" of Western culture culminated in such horrors, then the content and form of our relationship to culture must be reevaluated. The climate crisis is yet another kind of shipwreck unmoors us from our mythologies. The esteemed value of progress in technology, economic production, and the modernist project are running aground on the shores of

anthropogenic climate devastation. The modernist myth of the administrative state guided by expert science has hit its limit. Instead, the sense that science and politics are not yet fully real emerges, as discussed in Chapter 6. One solution might be to follow the lead of Flusser and MV Bill and willfully abandon mythological thinking.

Both mythical and historical modes are ruptured by an emerging "post-historical" mode where the horrific inversion of cultural "progress" and the production of "technical images" through new media undo the linear progress of history and the cyclical repetition of myth (Flusser 2004, 118; 2011a; 2013, 10). In post-history, creativity reigns supreme. Combining danger and potentiality, the world becomes an "absurd" game governed by chance, a "groundless" domain where reason, history, humanity, science, tradition, and myth cease to offer solid guidance (Flusser 2017, 19–20). Abandoning mythology and history for a post-historical mode of thought would thus appear to result in a drifting absurdism. In post-history, Ulrich Beck's prediction about the ecological risks of the 21st century comes true: "The past loses the power to determine the present" (1992, 34). The mythological cycle is broken and historical progress halts.

As this dissertation has demonstrated, engaging with the climate crisis post-historically is genuinely difficult. The most expansive aspirations of complex systems analysis struggle to practically account for the seemingly infinite dimensions of the addressing the climate crisis in all it environmental and political facets. The effort to holistically hold all the socio-environmental-technical aspects of the crisis within a single frame strains the imagination. The demand for data from countless localized sources exceeds scientific capacities. Donna Haraway may dream of the possibility of a "EcoEvoDevoHistoEthnoTechnoPsycho (Ecological Evolutionary Developmental Historical Ethnographic Technological Psychological studies)"

which would “indefinitely expand transknowledging,” (Haraway 2016, 150), but this is only a utopian dream that promises to provide a new mythological framework to make sense of the world.

In contrast, post-history leaves me with images that I cannot reconcile through mythology or reason. A chicken standing on drying, toxic mud in Bento Rodrigues, head held high against a backdrop of mud plastered ruins (fig. 25). My mind jumps to a meme some Mineiro friends showed me in 2018 where a live chicken stands on a pizza (fig. 26). We had been discussing the upcoming election at a local bar when they sent me the meme, suddenly laughing. I felt like I was missing the joke so I nervously asked for an explanation. “It’s a chicken pizza,” they both told me matter-of-factly, still laughing. Images of absurdist pizzas with toppings like the chicken or a car tire had been circulating rapidly on Facebook and WhatsApp. They do not contain any explicit political or symbolic meaning beyond their absurdism, but it is this very absurdity that may explain their popularity in Brazil amidst the seemingly farcical rise of an authoritarian “hero.”

Figure 25: Wreckage of the Mariana dam collapse (Moraes 2015).

Figure 26: *Pizza de Pollo* (2015)

People analyzing absurdist memes have hypothesized that the images are coping mechanisms: "a way to collectively disengage from the unending horror of politics by laughing at meaningless internet jokes that mirror the nonsensical global state of affairs" (Olsen 2018). Similarly, Mary Douglas noted that responses to ambiguity can range along "a whole gradient on which laughter, revulsion and shock belong at different points and intensities" (2002, 46). My friends' apparent deflection from the election into memes might be understood as a non-logical, non-mythological form of engagement with an absurd world. Similarly, despite it bearing no logical connection to the out-of-place chicken in Bento Rodrigues, my understanding of the chicken pizza as a reflection of it recognizes both images as outcomes of the same absurdly horrific world.

The absurdism shared by Flusser's post-history and pizza memes is not empty Dadaism. It is not a shrugging resignation to endless, cyclical toil. Instead, the vivid experience of post-historical horror and the futility of reconciling it through myth or history leads to an intimate awareness of the vital yet finite role of critical thought. As Flusser writes in *On Doubt*, one of his first texts written in Brazil responding to losing his family and home: "Whoever has authentically experienced, in one's intellect, the futility of the intellect, shall never be anti-intellectual again" (2014a, 13).

This dissertation has presented my effort, and efforts of the analysts I worked with, to think seriously and critically about a challenge that resists thought itself. More specifically, I have explored the collapse of past forms of thought in the face of inchoate horror. Here, it is possible to understand "form" by thinking with the work of Eduardo Kohn (2013). For Kohn, the concept of form offers a way to think the *relationships* between things, and to make the structing effects of these relations an object of ethnographic inquiry. In his work, "forms" refers broadly to

generalities such as "habits or regularities" that emerge[57] from discrete interactions. These forms range from the regularities of language (Kohn 2013, 158), physical geographic features like rivers and whirlpools (Kohn 2013, 162), and the superhuman, supernatural realm of spirit masters (Kohn 2013, 170). In each of these examples, forms guide beings towards some kind of regularity and stability.

Kohn specifies that forms act on the world "effortlessly." While the familiar model of causation, what Aristotle called "efficient causation," follows a "push-and-pull" logic where one object acts upon another and so on, form acts through the imposition of constraints which guide entities towards a stable arrangement (Kohn 2013, 163; Deacon 2013, 34–36). Kohn argues that form acts through what the Aristotelian tradition calls "final" cause, the insistent draw of a future arrangement of a system to act on the present. The final causation of form emerges from the particulars of efficient causes. In Kohn's example of Amazonian ecologies, one can see the intense effort of individual predators to hunt prey, ending the particular bodily forms of their food, but the overarching form of the a relatively stable Amazonian ecosystem emerges from all of these individual instances of predation (Kohn 2013, 119). In other words, while it might take effort to enter into a form, it takes it takes no effort to flow towards the final cause of form.

I am not critiquing Kohn's argument that forms exist and can impact the world through final causation. However, the tremendous effort of climate analysts to make sense of the climate crisis and to "do something real" indicates that more needs to be said about the experience and stakes of form's effortless efficacy in moments of transition and crisis. The stability of forms that provided an order and scaffold to science and environmental politics is challenged by climate

[57] "Emergence" is itself a technical term in Kohn's work drawn primarily from the work of Terrence Deacon (1997; 2013) referring to the creation of general properties that do not exist at more localized levels of a system. In other words, "emergence" is about the "whole" being "more than the sum of its parts."

change. Deprived of the forms provided by mythological thought, climate analysts must find alternative ways forward that do not rely on pre-existing structures, but rather on the capacity to improvise responses to unpredictable phenomena. Under these circumstances, the transversal ethics discussed in Chapter 5 take on a new significance. If we understand *logos* as a *form* of thought, i.e., a particular structure that gives shape, order, and meaning to knowledge, then transversality's implicit critique of *logos* constitutes a non-formulaic style of ethics. Using knowledge as a set of tools rather than an *a piori* system is one way of thinking of ethics without the support of form.

Engaging honestly with the difficult reality of horror demands thought, inquiry, and any piece of intellectual equipment we can bring to bear. However, it also pushes us to abandon our optimistic belief in our finite, human capacities to overcome challenges. This absurdism entails an engagement with the concrete and local conditions that formulate subjects and experience, without promising an epistemic authority or guaranteed practical success.[58] In her ethnography of orangutan caretakers directly witnessing mass extinction, Juno Salazar Parreñas cautions that the desire to completely avoid horror echoes the colonial faith in the capacity of experts to control the world. Facing extinction with care may troublingly demand that analysts and activists abandon faith and turn to "species-level palliative care to the end, without expectation of the species' survival" (2018, 159). This "palliative care" does not indicate apathy or resignment. Rather, Parreñas' image of palliative care faces the horrors of mass death more intimately, directly, and sensitively than the care derived from a misplaced mythology, that only sees care as worthwhile if we can be assured of success.

[58] Scholars of absurdism have termed this localized and concrete form of absurdism "the feminist absurd" (Derksen 2013; Bennett 2011) given its distinction from previous forms of absurdism which presumed a universal, transcendental subject. In contrast, feminist absurdism emphasizes the construction of the subject through their engagement with the absurdity of experience.

Out Beyond Pessimism

On the face, the post-historical and post-mythological rendering of horror may appear hopelessly pessimistic. I anticipate many readers demanding to know where one can find *hope* in this situation. Hope undergirds the Enlightenment mythology that the future will be better if we work towards it with the best tools at our disposal (Horkheimer and Adorno 2007). Without hope, this mythology crumbles into doom and despair.

I suggest that this prioritization of hope may be misplaced. Ethically and practically, we might need to collectively find a way to act without hope. As the journalist Carlos Maza (2021) asks in a video essay responding to the COVID-19 pandemic and the January 6, 2021 raid on the United States capital building, "If you are using hope to fend off your existential dread, there may come a time, kind of soon, when your hope starts to quit on you. And when it does, […] what comes next?" Neither I nor Maza empirically claim that there is no hope. Rather, Maza's question pushes me to consider how to envision moving forward even if success in finding a "solution" to the climate crisis is unlikely.

In response to his question, Maza turns to the work of Albert Camus, specifically *The Plague*. Camus's absurdism, emblemized by his reading of the myth of Sisyphus, embraces toil even in the face of certain failure. As Camus addresses the inhospitableness of a world without hope or reason, he states that "the absurd is born of this confrontation between the human need and the unreasonable silence of the world. This must not be forgotten. This must be clung to because the whole consequence of a life can depend on it" (2018, 28). Finding a response when hope fails is at the core of responding to the climate crisis, not because there is nothing to be done, but because there is so much that can be done to make an unjust situation more habitable, humane, and caring.

Seriously facing horror while it undermines hope may seem pessimistic, but taken as an ethical challenge, it moves beyond the bounds of pessimism. As the philosopher Joshua Foa Dienstag explores in his examination of pessimism (2009), the belief that the future will be worse than the present relies on the same mythological structure of history as optimism. Both pessimism and optimism understand time as a linear process moving unidirectionally from the past to the present to the future. Both place equal faith in human knowledge to confidently predict the future. Pessimism demands that we claim the epistemic authority to know the future precisely at the moment when that authority least assured.

The post-historical horror of the climate crisis does not conform to the certainty of either pessimism or optimism. We know that disasters are on the horizon, but the overall shape of the future is unknown and unknowable. This might seem pessimistic, but it is pessimistic about pessimism itself. With the future as-yet undetermined, the potential and necessity for concrete action is all the more pressing. The ethical challenge presented by the climate crisis and authoritarianism is not to "save" humanity or the world from death. Rather, the challenge is to care for life and each other *in spite* of hopelessness.

In this pursuit, I am reminded of two Brazilian leaders, each hopelessly facing disaster. The first is Dilma Rousseff. During her 2016 trial before the national legislature, Rousseff took the podium to issue a final self-defense on the charges of *pedeladas fiscais*.[59] The conclusion of the hearing and the end of her presidency were already palpable. Holding back tears, Rousseff's speech turned personal:

> Twice I've seen the face of death up close: When I was tortured for days on end, subjected to abuse that made us doubt humanity and even the meaning of life; and when a serious and extremely painful illness could have ended my existence. Today, I only fear

[59] While I am interested in Rousseff's address to the legislature, I do not seek to elevate her as a kind of hero for the climate crisis. Her appointed Minister of Agriculture, Kátia Abreu, was so opposed by environmental groups that she was given the nickname "*rainha da motoserra*" [chainsaw queen] (Watts 2014).

> the death of democracy, for which many of us, here in this plenary, are fighting with our strongest efforts.

Rousseff's fears are striking. She did not fear death, nor the end of her political career. She already knew that her presidency was over. Instead, she feared the end of the Brazilian democratic experiment more broadly, and encouraged continuing to fight in its interest even when hope seemed distant. Two years after her removal from office, Bolsonaro was elected president.

Facing the climate crisis without the mythological faith in success or control requires that we also not prioritize a fear of death. After all, it is a truism worth remembering that death is inevitable regardless of the global climate. If all we are trying to accomplish is "saving lives," we are doomed to failure. What is genuinely horrific about the climate crisis is not the potential loss of life. Rather, what is horrific, at least to me, is the injustice and cruelty of how that loss will be distributed if nothing is done. As discussed in Chapter 2, climate vulnerability is not equally shared, and those most likely to be negatively impacted are the same populations historically exploited by colonialism, resource extraction, and socioeconomic inequality. Like Rousseff turning from her near-death experiences towards the death of democracy, we must similarly keep focus on the ethical dimension of environmental destruction. By focusing on simply saving lives, we risk losing sight of this vital task.

The second model for facing disaster is inspired by the Indigenous leader Ailton Krenak, who in 2019 delivered a lecture in Brasília about the Mariana dam disaster. The speech was eventually published with the title *Ideias para adiar o fim do mundo* [*Ideas to Postpone the End of the World*]" (2019). The bold title is a joke that addresses horror with absolute seriousness. His choice of the title was, by his own description, somewhat flippant. While doing yard work, he received a surprise phone call inviting him to give the presentation at the *Universidade de*

Brasília. He eagerly accepted the offer, but distracted by his work, he offered the lecture's title without much hesitation. The next day, he flew to the national capital to give his lecture and was shocked to find that the auditorium was packed. As he recounts, "I asked [the organizer], 'Are all of these people in the graduate program?' My friends said: 'Of course not, students from the entire campus want to hear how to prevent the end of the world.' I replied, 'Me too.'" (Krenak, 2019: 9)

True to his word, Ailton Krenak never offered a comprehensive way to save the world. In fact, his text offers nearly the polar opposite. As a response to the impending feeling that the world is ending or has already ended, Ailton Krenak pushes settlers to interrogate why this experience inspires dread. Mirroring Flusser's diagnosis of Auschwitz as being implied by Western civilization from the start, Ailton Krenak presents so-called "development" or "progress" as inherently steps towards the destruction of the planet and Indigenous peoples. Considering this longstanding enshrining of apocalyptic forces, he asks:

> Why does this falling feeling disturb us? For a while, we have only been falling. Falling, falling, falling. So why does falling bother us now? Let us use all of our critical and creative capacities to create colorful parachutes. Let us think of space not as confined, but as a cosmos where we can disperse in colorful parachutes. (Krenak, 2019: 14–15)

Facing the end of the world, or as I suggested in the introduction, the end of worldhood, is not a moment for resignation or defeat. It is a moment that demands a reconsideration of the history that brought us to this moment, the apocalypses that have filled its pages, and of the creativity that can and must flourish in building a more vibrant future. Abandoning the reassurance of mythology and expertise offers a vantage on horror that reveals its absurdity and irreducible strangeness without abdicating the responsibility to confront it. This may mean learning to live without hope.

Coda: Transversal Poetics of Disasters

Walking down a winding, cobblestone road in Ouro Preto, the historical centre of Minas Gerais' colonial mining operations, I came across the small *Galeria de Arte Nella Nuno*, which was hosting an exhibit by Mineira women responding to the Bento Rodrigues dam collapse. The gallery had taken over the first floor of a two-story home that had been remodeled to an open-plan space overlooking a cliff. Christiani Papini's *Era doce e acabou* (2016), a collection of irregular mud tiles, snaked their way from the centre of the room to the far upper corner (fig. 27). In the middle of the room, the tiles were the reddish brown of the mud throughout Minas Gerais, rich in clay and mineral residues. Through the window behind the piece, light from the rolling hills of former mines reflected off the muddy glaze. Closer to where the tiles meandered up the wall, they shifted hues toward dark blues and bright teals. The Portuguese term for fresh water,

Figure 27: *Era doce e acabou* (Cândido 2018)

"*agua doce,"* leaves some ambiguity about how to translate the title into English, since it calls to mind potable water as well as cleanliness or sweetness, the literal translation of *doce*. My best attempt at translation is: "It was clean [or sweet] and then it ended." The sweet, clean water continued toward the wall and flowed up on its own plane, affixed to a piece of paper that rounded the corners of the gallery space.

In the exhibit description, the only substantial text in the gallery, the artists collectively describe their works as "the confrontation of the processes of destruction and rupture, lived through (*vivenciados*) their poetics, and artistic processes." As a poetic appropriation of the disaster, the exhibit offered a glimpse of possible exits from the gloom the climate crisis. *Era doce e acabou* engages with disasters in a way that does not forget the past, but also does not dwell on what has been lost. Rather, it climbs the walls, spills out the window, and runs out into the hills, moving towards a future of new alliances and new modes of life after horror.

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