CLIMATE POLITICS AFTER NATURE AND THE MANAGEMENT OF GLOBAL ENVIRONMENTAL CRISES IN BRAZILIAN AMAZONIA

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David Manuel Rojas

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CLIMATE POLITICS AFTER NATURE AND THE MANAGEMENT OF GLOBAL ENVIRONMENTAL CRISES IN BRAZILIAN AMAZONIA

David Manuel Rojas, Ph. D.

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ABSTRACT

This dissertation is an ethnographic examination of an environmental policy known as REDD+ (Reducing Emissions from Deforestation and Forest Degradation—the "+" signifies improved carbon stocks). REDD+ was designed to lessen climate change by reducing deforestation in Amazonia—a goal that would be achieved by paying landholders to keep their forests standing. This proposal has been highly influential at United Nations (UN) environmental forums. I study REDD+ as a scheme that, in the region of Amazonia in which I worked, reflects peasant and scientific understandings of tropical forests. REDD+ proposals engage forests as humanized spaces long transformed by global capitalist dynamics and that will be further transformed by purportedly unavoidable socio-environmental crises. I claim that this policy marks a profound shift in the ecological imagination. Environmental debates at the UN have often portrayed Amazonia as "pristine Nature"—a non-human realm that experts believed could be made into an inside in which they could further contemporary modes of human living. In contrast, I argue that REDD+ schemes engage Amazonia as a human-shaped space of intensifying environmental crises that experts cannot bring under control. In chapter one I explore the links between REDD+ proposals and mid-twentieth-century development projects in Brazil, focusing on how developmental planners and REDD+ proponents both assumed that Amazonia's transformations by the forces of industrial capitalism were unavoidable. In chapter two I examine descriptions of REDD+ offered by Amazonian peasants. They saw this policy as yet another instance of economic forces that challenges poor peasants to establish particularly hostile relations with humans and non-humans alike. I examine the scientific practice of pro-REDD+ scientists in chapter three. I show that Amazon-based environmental scientists investigate Amazonia as a shifting socio-natural situation that will continue unraveling in the foreseeable future. Chapter four studies REDD+ contributions to UN negotiations that climate diplomats themselves see as insufficient to avoid potentially catastrophic climate change. My multi-sited approach advances the understanding of contemporary environmental politics by examining REDD+ as radical philosophical-anthropological proposition: that humans should learn to endure the worlds they have made into precarious spaces.

BIOGRAPHICAL SKETCH

David Rojas obtained his Bachelor of Arts from the University of Los Andes in Bogotá, Colombia, where he completed two years of undergraduate coursework in plastic arts before switching careers to study political science—a program from which he graduated with honors in 2002. He continued his studies at the University of Cambridge in the United Kingdom, receiving an M.Phil. in Social Anthropology Analysis in 2004. In 2007 he began his doctoral studies at Cornell University's Anthropology Department, focusing on the study of climate politics in Brazilian Amazonia

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LIST OF ABBREVIATIONS

BNDES	Banco Nacional de Desenvolvimento, Brazil's National Development Bank
CO_2	Carbon dioxide
COP	Conference of the Parties
GHG	Greenhouse gas
GMO	Genetically modified organism
LBA	Large-scale Biosphere-Atmosphere experiment in Amazonia
NGO	Non-governmental organization
REDD+	Reducing Emissions from Deforestation and Forest Degradation and enhancing carbon stocks
Rio 92	1992 United Nations Conference on Environment and Development
Rio+20	2012 United Nations Conference on Environment and Development
SBI	Subsidiary Body for the Implementation of the Kyoto Protocol
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change

INTRODUCTION

"ENTROPOLOGY"

Figure 1. Rondon's telegraph project under construction in Southern Amazonia.
From: Todd A. Diacon, *Stringing Together a Nation*, 2004.

In 1938, Claude Lévi-Strauss led an expedition that trekked across the southern edge of the Amazon basin. He advanced over the path opened between 1909 and 1915 by a 600-strong party that laid down a telegraph line across the region (Figures 1 and 2). The telegraph project was led by Colonel Cândido Mariano da Silva Rondon, a fervent follower of August Comte's positivism who saw himself driving a wave of planetary progress into the region (Diacon 2004). Rondon imagined the telegraph as a means of civilizing the world that would transform the basin into a thriving agricultural zone similar to the United States' Midwest. Moreover the changes Rondon labored to accomplish in Amazonia were means to a larger goal: to connect human populations scattered across the planet so that "humankind" would become "Humanity" (*idem*).
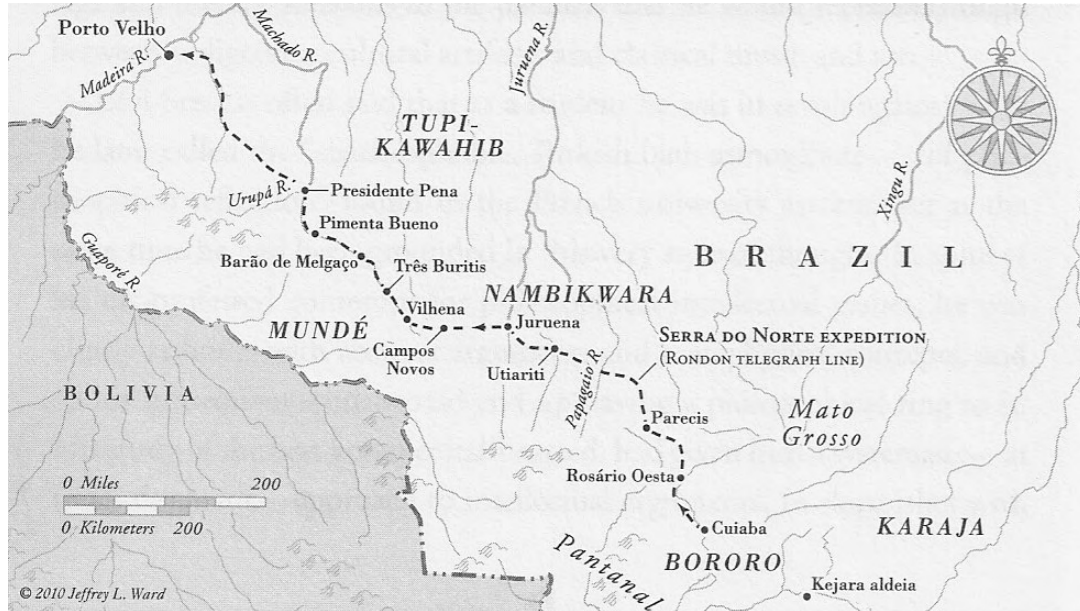
Figure 2. Lévi-Strauss's expedition following Rondon's telegraph project.
From: Patrick Wilcken, *Claude Lévi-Strauss: The Poet in the Laboratory*, 2010.

Following Rondon's trail, Lévi-Strauss saw the telegraph project and Southern Amazonia in much bleaker terms. For him, indigenous communities reached by the telegraph had not joined a global human community; they had been "caught like game birds in the trap of our mechanistic civilization" (Lévi-Strauss 1955 [1974]: 42, 302; 1948). From Lévi-Strauss's perspective, the sprawl of civilization in Amazonia meant the disintegration of non-Western institutions and customs and the cultivation of a homogeneous human form that was unfit for anthropological writing. "One should write 'entropology'" Lévi-Strauss argued, "the word for a discipline that devotes itself to study such a disintegration process in its highest manifestation" (*idem*: 397).

In this dissertation, I critically revisit Lévi-Strauss's notion of "entropology"—the fictional anthropological subfield concerned with a disintegration process that would

melt humanity away—to examine policies that address socio-environmental changes taking place in Southern Amazonia. As I clarify later, the notion of entropology has insurmountable problems related to its romantic undertones and fatalistic tenor. I argue, however, that the concept is anthropologically useful when compared with the views of populations who live through, and contribute to, socio-environmental transformations in the area where Lévi-Strauss traveled. I claim that, although Lévi-Strauss's diagnosis of Amazonian shifts is uniquely his, the anthropologist was not alone when anxiously asking whether human actions in the region could fundamentally undermine human modes of living.

Over the course of two years of ethnographic fieldwork I lived with peasants who transform forests into pastures and farmlands at the southern border of the basin, worked with scientists who study socio-environmental changes in the region, and followed diplomats to United Nations (UN) environmental forums in which they discuss Amazonian developments. I also examined development proposals for Amazonia proposed by high-level members of Brazil's military government (1964–1985). These four populations see ongoing socio-environmental shifts in Amazonia in ways that are unlike one another and different from Lévi-Strauss's. Nonetheless, they all shared with the anthropologists the unsettling idea that intensifying Amazonian transformations challenge them to reconsider what humans may become as they disrupt the worlds in which they live.

The people with whom I worked expressed profound anxiety when discussing their own contributions to Amazonian dynamics that they sensed altered the conditions of human existence. Reconsidering Lévi-Strauss's writings about his experiences at the

southern edges of Amazonia makes it easier to explore the experiences of statesman, peasants, and scientists regarding the roles they play in the transformation of Amazonia and the reconfiguration of human modes of living. Moreover, the notion of entropology is also useful for examining environmental policy approaches in which my interlocutors participate. Over the past decade scientists, forest populations and state officials have advanced a new environmental scheme in Southern Amazonia designed to manage ongoing environmental transformations. Those who take part in the ecological approach I consider in this dissertation argue that, since it is not feasible to arrest potentially catastrophic human-driven ecological changes, environmental schemes should provide a space in which people may learn how to live in increasingly inhospitable worlds. I argue that experiences of profound socio-environmental disruptions and complex questions concerning shifting modes of being human inform environmental policies that are being designed and implemented at the southern border of the Amazon basin.

Experiencing Worlds in Transformation

In the seventy years since Lévi-Strauss's expedition the socio-environmental changes the anthropologists experienced in southern Amazonia have accelerated and intensified. The southern edge of the Brazilian Amazon has become the home of millions of people who have arrived over the decades, following the construction of dams, highways, and new cities by an often violent combination of state projects and private operations. Meanwhile indigenous groups have been decimated and pushed into reserves as most of the land has been gradually bought or taken over by large landholders.

Lévi-Strauss foresaw some of these developments in 1935, three years before his

Amazonian expedition, when he traveled across Southern Brazil as an aspiring

ethnographer. At the time, railroads and highways were under construction, native

vegetation fell rapidly in the path of agricultural development, and state and private

companies hurriedly erected new cities. In *Tristes Tropiques*, Lévi-Strauss anticipated

that such transformations would one day reach Amazonia as part of a planetary shift:

"civilization," he wrote, was no longer the delicate flower it once had been. It no longer

needed protection from surrounding, savage species. To the contrary, "humanity has

settled itself in monoculture . . . and is preparing to produce civilization in bulk, as if it

were sugar-beet" (Lévi-Strauss 1974: 39). For the anthropologist, these changes in the

land affected more than Amazonian sites or populations; they reflected a larger trend

that undermined the rather fragile conditions that allowed humanity to thrive. Lévi-

Strauss's account of his fieldwork in Brazil concludes with musings about a future

world that would not accommodate humanity.

> The world began without the human race and it will end without it. The
> institutions, manners, and customs which I shall have spent my life in
> cataloguing and trying to understand are an ephemeral efflorescence of a
> creative process in relation to which they are meaningless. (Lévi-Strauss 1974:
> 397)

Today soybean plantations, not sugar beets, spread across the region through

which Lévi-Strauss traveled (Figure 3). Over the past two decades farmers at the

southern edges of the Amazon basin have invested heavily in agro-industrial modes of

production and, benefiting from substantial public support for agribusiness, have

transformed the region into one of the world's main agricultural hubs. Southern

Amazonia today grows massive amounts of soy, corn, and cotton, mainly for export to

China and Europe. A plateau that Lévi-Strauss once described as "desolated" today

houses colossal buildings, animal farm operations, meatpacking factories, and biodiesel plants. The area is known for its very high agricultural yields as well as for having given birth to powerful Brazilian corporations that play increasingly central roles in global systems of food production. The populations with whom I worked during my fieldwork experienced these transformations in ways that raised questions that cast a new light on Lévi-Strauss's concerns regarding the emergence of worlds that were feared to be inimical to human modes of being.

Figure 3. Agro-industrial town in southern Amazonia located in the path of Rondon's telegraph, 2010.

As I explain in chapter one, powerful members of Brazil's military government explicitly characterized their plans to develop Amazonia as endangering human conditions of existence. In the mid-twentieth century, Brazilian statesmen designed and implemented projects to transform the region across which Rondon and Lévi-Strauss traveled. These development projects aimed at altering Southern Amazonia by promoting the migration of millions of people whose task would be to build massive works of infrastructure. Unlike pro-development experts who thought their plans could improve human livelihoods, the Brazilian elites whose proposals I study described their projects as militaristic undertakings that would engage the country with the Cold War's

global struggles. Against the looming prospect of nuclear war, development experts wrote about their Amazonian projects as profoundly *irrational* efforts that could contribute to self-destructive geopolitical struggles capable of bringing human life to an end.

These fatalistic insights regarding development proposals in Amazonia were not limited to Brazil's military elites. The peasants with whom I lived in Southern Amazonia expressed similar concerns as they described their work as contributing to economic operations that build unstable worlds in which poor people like them could find no place for living. The peasants with whom I worked were *not* traditional or indigenous peoples but rather landless populations who, for generations, had migrated across the basin working on development projects and capitalist operations unleashed by the military government. Unlike forest populations who depend on Amazonian ecologies, landless peasants could not live by subsistence farming alone and without access to the cash economy they faced extreme depravation, hunger and illness. Their modes of living thus depended on expanding capitalist operations that built roads, established markets for rural commodities, and provided wage labor opportunities. While they traveled across the basin they also tried, the majority of them unsuccessfully, to acquire a small piece of land on which they could settle down. Their itinerant modes of living challenged them to cultivate skills needed to engage in activities as diverse as logging, farming, ranching, illegal gold mining, operating agro-industrial equipment, and working as guns for hire.

As the explorations on which I report in chapter two reveal, peasants explained to me that the very capitalist dynamics without which they could not survive in

Southern Amazonia *undermined* their chances to build places of their own. Expanding

capitalist operations benefited a small number of powerful individuals who used force

together with economic and political maneuvering to claim vast tracts of land.

Meanwhile, most small landholders—the people who actively transformed forests into

pastures and farmlands through grueling and dangerous labor—regularly went bankrupt,

lost their lands, and were forced to migrate every few years. In addition to the socio-

economic forces that constantly pushed them into landless living, the peasants with

whom I spoke argued that the capitalist operations for which they worked were

disrupting rains and increasing atmospheric temperatures. These ecological

transformations were understood to further undermine their chances of building sites on

which they could live. Peasants explained to me that in order to take part in Amazonian

transformations they had to cultivate singularly aggressive modes of being human that

made it possible for them to live in characteristically inhospitable worlds.

 The scientists I met during my fieldwork made sense of ongoing macro-

ecological transformations in Amazonia by drawing on a range of experiences that, in

spite of dissimilarities, overlapped with the experiences of peasants. The scientists with

whom I worked were Brazilians or had worked in Amazonia for decades. Ranging from

graduate students to Nobel Prize winners, a few were born in Amazonia to landless

peasants, living through cycles of bankruptcy and migration as they grew up in the

basin. Crucially, their groundbreaking work departed in radical ways from previous

environmental research agendas. Until recently, a majority of natural scientists

specializing in macro-ecological dynamics in Amazonia studied the basin as a system in

dynamic equilibrium. From this perspective, human actions were interpreted as external

elements that should be prevented from entering and polluting "pristine forests." In contrast, the scientists whose work I study see Amazonia as a complex system that includes both native ecologies *and* human works—such as agro-industrial plantations, cities, and works of infrastructure. In their view, Amazonia is *not* a pristine forest but a shifting combination of human populations, vegetation processes, chemical fluxes, and non-human animals.

In chapter three I explore the work advanced by this group of scientists at the southern border of the Amazon basin. This area figures importantly in their research as a zone in which the environmental impacts of human actions are particularly strong. Southern Amazonia is an area of ecological transition hundreds of miles wide—a place in which tropical forests to the north meet tropical savannas that extend to the south. There, scientists study disruptions in the rain regime driven by the expansion of pastures and agricultural lands—which is resulting in a dryer ecosystem that scientists fear may undermine environmental conditions for human and non-human life. Significantly, in their work, scientists criticize characterizations of such disruptions as the outcome of humans unwarrantedly interfering with a static ecology. Similarly, they criticize views of the forest as an inert object that people disrupt from the outside. Scientists reveal the ongoing savannization of parts of Amazonia as the outcome of complex processes involving trees, soils, animals, and biochemical transitions *creatively responding* to—and reinforcing—human actions. From this perspective, they position socio-environmental disruptions as an opportunity to examine the innovativeness of complex ecologies whose behavior unpredictably shifts together with a changing climate. As a consequence, the environmental politics these scientists support are designed as

massive-scale experiments that, carried out in collaboration with non-human entities, may shape increasingly unstable worlds.

The last population included in my study is a group of diplomats whose work I studied at four UN conferences on the environment. I attended these summits to examine interactions between Amazon-based scientists and UN experts who, over the past decade, have taken part in a radical remaking of global environmental politics. When, in the 1990s, negotiations towards a global climate agreement began at the UN, analysts pointed out that such efforts could mark the dawn of technocratic rule at a planetary scale. For example, critics of the UN process feared that scientists and climate diplomats would collude, arguing that, in order to preserve the Earth System, pristine forests should be protected from human impacts. This approach would entail placing sites such as Southern Amazonia under strict protection programs that would severely restrict local livelihoods. Hence, Amazonian populations and ecosystems would be brought within a vertically integrated system wherein a cadre of experts at the UN would be granted unchecked powers.

Despite the strengths of this critique, it does not ring true when applied to the diplomats with whom I worked, who are *not* experts in the construction of centralized systems of global technocratic rule. Quite the contrary, they work with scientists and Amazonian populations in constructing a global system of environmental politics that is highly fragmented, grants virtually no power to environmental scientists, and is *not* presented as capable of averting major socio-environmental disruptions. Instead the diplomats aim to create a policy framework that would make it easier to manage potentially catastrophic climate transformations.

In chapter four I focus on climate diplomats who drew on environmental science research to undermine the efforts of Northern experts to build a global regime that would have placed Amazonia under the rule of Northern technocracies. The diplomats whose actions I examine mobilize the work of Amazon-based scientists to argue that the basin was *not* (could no longer be seen) a natural landscape that could be preserved in "pristine" form. Similarly, they mobilize arguments put forward by forest populations who, as I mentioned, see the forest as a composite of human and non-human dynamics characterized by social and economic contradictions. Through their work, diplomats seek to destabilize Northern policies that were presented as capable of "saving Nature," instead formulating plans to manage purportedly unavoidable socio-environmental disruptions.

My work engages the concerns that Brazilian statesmen, Amazonian peasants, Amazon-based environmental scientists, and climate diplomats express regarding shifting modes of being human in the context of human-driven ecological disruptions. The practices of these populations, I claim, bear understandings that echo Lévi-Strauss's thoughts on entropology. Statesmen advocate for development projects while asking out loud what kind of force humans are becoming as they engage in potentially suicidal geopolitical struggles. Meanwhile, peasants who worked for Amazonian development projects see themselves as undermining the very socio-economic and ecological conditions that would be necessary for them to have a place in which to live. Similarly, scientists whose life-histories overlap with the experience of landless peasants study the emergence of disruptive environments as the outcome of experiments in which they take part. Finally, climate diplomats contribute to global environmental

politics that are insufficient to avert potentially catastrophic climate crises. Revisiting Lévi-Strauss's views on Amazonian transformations makes it possible to examine, as anthropological questions, the doubts expressed by these populations about ongoing socio-environmental transformations.

In addition to the questions I examine about emerging modes of being human, there is a second focal point in this dissertation that allows me to connect the understandings of the various populations with whom I work. This second argumentative axis is a climate policy strategy known as REDD+ (an acronym for *Reducing Emissions from Deforestation and Forest Degradation*—the "+" signifies improved carbon stocks). REDD+ was designed to provide monetary incentives to Amazonian landholders in exchange for reducing emissions associated with deforestation. The four populations with which I worked were involved directly or indirectly with REDD+ initiatives in southern Amazonia.

My central argument concerning REDD+ diverges from critiques of environmental politics as the imposition of Northern discourses on Southern populations across the globe. Such criticisms situate current environmental schemes within Western rationalities and systems of expertise dominated by Northern technocracies. From this perspective, REDD+ is seen as a policy informed by technocrats who, behaving as Descartes's heirs, think they can create a stable environment in which humanity will flourish. All environmental roads, it seems, lead to Cartesian ideas of Humanity as a force that can rule over Nature. Although I agree with some of the main ideas of such an argument, I ultimately find this interpretation to be

problematic. Southern populations are seen to be victims oppressed by ecological agendas or co-opted by environmental efforts. At most, people such as landless Amazonian peasants are taken to be reactionary elements that resist policies that originate elsewhere. There is no space here in which to consider the creative role played by poor populations that, while indirectly shaping REDD+ schemes, are deeply concerned about this policy's capacity to intensify long-term socio-environmental problems. More significantly, such criticisms ignore the fact that those who first proposed REDD+ schemes were *not* Northern technocrats but Amazon-based scientists with close ties with forest populations and powerful Brazilian interests.

I contend that REDD+ can be best understood as part of an *Amazonian* history that is traceable back to the socio-environmental transformations experienced by Lévi-Strauss. Moreover, I show that REDD+ does not respond solely to Northern interests but expresses the political influence of Brazilian state elites, scientists, and the country's agro-industrial and ranching operations. In this sense, REDD+ is *not* the outcome of Western science—if by this we understand modes of knowledge articulated around Anglo-European institutions and political dynamics. Rather, REDD+ is the expression of characteristically Amazonian environmental research agendas and its success is due to a great extent to the support that *some* forest populations and major Brazilian corporations have lent to the scheme. This is not to say that REDD+ is unproblematic. To be sure, several indigenous, traditional, and landless populations in Amazonia and elsewhere oppose REDD+ on strong grounds. My claim, however, is that REDD+ is a policy whose problems may be better understood by examining it as a scheme that, in the areas of Southern Amazonia in which I work, is designed to create a space in which

humans may learn to live through disruptive worlds of their own making.

REDD+ Critics

The core ideas behind REDD+ were put together by a coalition of scientists and officials from non-governmental organizations (NGOs) whose scientific and environmental policy work in Southern Amazonia is highly recognized worldwide. This group took REDD+ ideas into United Nations (UN) climate policy deliberations and succeeded in making this proposal one of the main items on the climate change diplomacy agenda—thus effectively shaping international environmental law. REDD+ has since become a central part of the policy repertoire of institutions such as the World Bank and the UN Environment Program and has helped channel hundreds of millions of dollars to environmental projects in Latin America, Africa, and Asia (Agrawal, Nepstad et al. 2011, Corbera 2012).

As I mentioned, REDD+ has been the object of much deserved criticism from scholars who address this policy as adding to one or more of the following trends: commodification, environmental securitization, ecological aestheticization, and the institutionalization of legal simulacra. Regarding commodification, James Fairhead and colleagues recently described the market schemes on which REDD+ relies as conveying a "mercantile optimism," the belief that it is possible to create an "economy of repair" wherein monetary flows would fix environmental problems and guarantee ecological sustainability (Fairhead, Leach et al. 2012, Leach, Fairhead et al. 2012). A second line of criticism sees in policies such as REDD+ efforts to "securitize" climate change as a threat to "vital systems" in response to which vertical policies are implemented, thus rendering environmentalism into a "post-political" project that removes ecological

matters from democratic discussion (Dalby 2013, Swyngedouw 2013, Collier and Lakoff 2014). A third line of criticism points out that environmental projects based on GHG emissions-accounting practices aestheticize forests in ways that make them into spaces of legibility wherein the complexity of socio-environmental relations are erased in order to build landscapes that are amenable to political dominium and expert mastery (Lansing 2011, Gupta, Lövbrand et al. 2012, Lansing 2012). Finally, the success of REDD+ proposals in international environmental law forums has been seen as a sign that this approach is particularly well-suited to the UN's "politics of simulation" wherein scientific and environmental documents are combined in empty diplomatic gestures that have the effect of reassuring global audiences that no fundamental changes are needed to face unfolding environmental crises (Blühdorn 2011).

I examine these four lines of criticism of eco-political approaches in four separate chapters (which, in order, address issues of security, economics, aesthetics, and international law). While each of these chapters draws on the aforementioned insights, they also question an assumption that underlies all these criticisms: that REDD+ and other climate politics like it are driven by *homesickness* in the sense that they strive to normalize and preserve a reality seen as familiar by environmental experts. The assumptions under which critics of REDD+ and similar policies work is that these are efforts to create a planetary "inside" using the tools and strategies that belong in conventional systems of expertise: state institutions are called to normalize socio-environmental processes and guarantee environmental security; market mechanisms are created to "internalize" externalities and coordinate complex socio-ecological undertakings; scientific modes of knowledge are deployed in order to reveal the lawful

oeuvre that binds the biophysical world into a beautiful, total composition; and international laws are drafted to overcome the differences that push global populations apart.

The quest for a homely "inside" of security and commensurability, critics claim, would have alienating effects as it obscures the vibrancy of non-human processes that are incommensurable with state or market rule (Gabrys and Yusoff 2012, Connolly 2013, Morton 2013). Many see the politics of the homely as erasing the links between environmental and colonial problems that cannot simply be superseded by means of aiming for higher (transcendental) environmental goals (Chakrabarty 2009, Bennett 2010). Although these critics accurately convey the tenor of some environmental politics, I argue that they miss REDD+'s defining characteristic. Forest carbon markets signal a type of climate politics that actively and explicitly configures an "exterior" that is not anticipated to be safe, commensurable, beautiful, or lawful. This is easier to understand by means of two examples, the first of which illustrates the politics of "insides" and the second of which illuminates a political approach I call "exterior design."

Colonel Rondon provides me with the first example. We can examine the telegraph line he built across Southern Amazonia as a work of environmental politics broadly conceived as he strived to remake the region into a future agricultural area similar to the US Midwest. We can see in this ambitious project an engagement with Amazonia as an inside in the making. Even the deaths of dozens of men and the hardships the crew endured during the project did not shake Rondon's assumption that Nature was predisposed to accommodate humanity, that the area could be domesticated

by human ingenuity, engineering prowess, scientific knowledge, and the organized deployment of disciplined manpower. Rondon saw Amazonia as "Nature" (a word that throughout the dissertation I write with capital "N" to underline its cultural and historic specificity). Nature, that is, as "inert stuff" lying *outside* a human sphere of creativity and spontaneity, a collection of raw matter whose behavior is pre-determined by a web of causal relations. Nature's outside, nevertheless, was not *exterior* to humanity. Like others who held "naturalist" understandings of the world (Bryant, Srnicek et al. 2011, Descola 2013), Rondon thought Nature was predisposed to human cognition and to material acts of incorporation that could create in spaces such as Amazonia a more inhabitable world. This is the politics of insides, of practical understandings that rest on the assumption that the more humanity inhabits and transforms the planet the more it will become a safe, commensurable, familiar, beautiful, and lawful sphere within which humans may comfortably live.

Critics of REDD+ are right to assume that such naturalistic assumptions underpin some contemporary climate politics. However, they overlook the extent to which, among various populations involved in REDD+ proposals, we find the post-naturalistic understanding that the worlds humans inhabit are increasingly *indifferent* to human existence (for this understanding of indifference see Meillassoux 2010).

This takes us to the second example I use to make my point, that of "exterior politics." This example comes from an interview I had with a senior scientist who used her long-term research on socio-environmental transformations in central Amazonia to successfully advocate for REDD+ proposals at UN environmental summits. She spoke hesitantly of fear and fright as we discussed the worlds that she anticipated would come

into being in the mid-term future: "I am sad because we are going to keep losing languages and cultures, and also plants [pause] but it's much more frightening to think that we are actually going to change our atmosphere more than we can change it back." After a brief pause she added,

> At some point I don't care if we do not have a primary forest again as long as there is something there, maintaining the atmosphere and maintaining the hydrological functions. I know that a monolithic, secondary forest is not what we want and will probably bring its own problems. But I would much rather see something there rather than nothing. You know? And that is, I think, the source of my pragmatism. And optimism. Maybe. Where I just say, okay. I am okay. I can accept this.

In this brief fragment of our conversation she laid out the three fundamental characteristics of exterior design. She first described the horizons toward which she worked, underlining the sadness and the fright associated with sensing unavoidable and irreversible loss of human and non-human life. Such loss not only entails the disappearance of discrete elements in the world such as people and plants but the disruption of *fluxes* that materially make the world—and whose significance is exemplified in the cycling of CO_2 and water that determine atmospheric temperatures and rain regimes that compose the conditions under which tropical forests thrive. At a second moment in her argument she went on to explain how the anticipation of increasingly foreign worlds led her to champion clearly problematic policies. She was even ready to support (not just yet, but if such a time would come) plans to grow forest plantations in an effort to try to counter the disruption of ecological flows and slow the ongoing savannization of Amazonia. There was absolutely nothing, however, heroic in such an act which she could not justify on rational grounds as an effort that would create more familiar, beautiful, or manageable situations. The plan for forest plantations

would "bring its own problems" and the fluxes of CO_2 and water they could compose would add to the unhomeliness of worlds in which she saw living herself in the future.

This led her to a third moment in which she compared her proposals with the "nothingness" that would emerge from collapsing macro-ecological processes. At this point she offered a *pragmatic* appraisal of her policy approach that had no recourse to general principles and did not lead to a self-consistent judgment of necessity. Her claims of being "optimistic" did not come naturally and she constantly hesitated, paused, and thought out loud during our conversation. "Maybe" she said, the "something" of engineered hydric fluxes would be better than the "nothingness" of climate catastrophe. But only "maybe." At any rate, her "monolithic, secondary forest" was not a roof towards which she gladly ran to escape the adverse and strange Amazonian climate. No, her own proposals seemed to strike her as unfamiliar and she could articulate them only because she had come to "accept" them. Even during our conversation I had the sense that she was still working (that she would always need to work) on convincing herself of the correctness of her decisions and her capacity to endure them: "I just say, okay. I am okay. I can accept this."

This conversation exemplifies others I had with influential policy-oriented scientists who intervened in worlds in flux without expecting they would be able to create anything like an inside of security, commensurability, beauty and lawfulness. Moreover, I claim that the scientists behind REDD+ and the diplomats who discussed this approach and other carbon market schemes at the UN converged in their support for a form of climate politics that had to be endured by its own proponents—rather than celebrated as the work whereby humans would realize the planet's disposition towards

human modes of living. Furthermore, I argue that there is broad practical agreement between diplomats, scientists, and Amazonian populations who live in areas in which REDD+ was supposed to be implemented. Albeit they face radically contrasting situations and draw on fundamentally diverse histories and experiences, these three populations engaged with dominant climate politics as efforts designed to take them further into radical exteriors that were indifferent to human existence.

Such exteriors were not Natural, in the sense they were not invariant, lawful, beautiful, or sensed as predisposed to human living. The exteriors I examine in this dissertation closely resemble what Quentin Meillassoux has called *dehors* (a concept problematically translated into English as the "great outdoors," Meillassoux 2010: 7). Meillassoux's "exterior" alludes to realities that are not relative to humans, which exist in themselves regardless of whether we are thinking of them or not. Such exteriors challenge us to consider the cosmological possibility that reality will continue after the disappearance of the human species. Such an unsettling world this is, one in which we are no longer (at least not in a form in which today we would recognize ourselves as humans). When this exterior becomes the horizon of climate politics then global environmental proposals amount to an exterior architecture. A policy such as REDD+ would entail grappling not only with the impossibly difficult question of how to think in worlds that are radically foreign to humanity, but also with how to actively build such profoundly unhomely situations.

This dissertation thus departs from studies that treat climate politics as efforts to preserve order and invariance through the construction of "insides." Most of anthropology's methods have been designed to study "human insides" such as

economic behavior, symbolic systems, social structures, religious beliefs, cultural interpretations, and so on. Meanwhile, non-human issues such as geological formations or atmospheric dynamics have understandably remained non-anthropological matters. My study of exterior design fits in with a number of recent anthropological studies that place non-human processes and dynamics at the center of analysis (Kirksey and Helmreich 2010, Kohn 2013). My particular contribution to this literature is an ethnographic study of climate change as a process that is politically significant "in itself," not as a discourse or cultural understanding, but as a shifting materiality that exceeds human discourses and representations. A rapidly changing planet may be driven by human actions but it cannot be located within the "insides" of human minds or cultures. From this perspective, what is significant about climate politics such as REDD+ is that they are not designed to arrest intensifying planetary crises and therefore accept the weakening of the grounds based on which human insides are built. Climate politics thus do not appear as the assertion of human capacities to dominate the planet and instead can be studied as acts whereby non-human forces are allowed to express themselves and assert themselves shaping political dynamics.

Another way of putting it would be to say that, through material actions over the long term, humans have brought to life powerful non-human forces (commodity flows, industrial infrastructures, shifting environmental patterns) whose disruptive capacities are being accepted as an intrinsic part of a particularly animated planet. For example, in southern Amazonia we find a material situation (pastures and farmlands, meatpacking factories, disrupted rain regimes, growing human populations, intensifying atmospheric deployments of industrial inputs . . .) that experts and non-experts living in the area

sense are making human modes of living more difficult. And yet these same populations do not see any alternative to environmental projects that accommodate the continued growth of capitalistic and industrial operations. Climate politics thus designed is less an expression of abstract human rationality or logics and more the result of the situating cultivation of capacities that allow persons and groups to cope with the experience of planetary dominance of entities that, even if shaped by human actions, remain exterior to human modes of living.

Lévi-Strauss's notion of enthropology offers important clues to inform an anthropological study of exterior design, as it signals the limits of the anthropological study of human insides and signals a path towards an ethnographic examination of exterior design.

Entropology and the Study of Human Exteriors

In interviews he offered late in his life Lévi-Strauss often expressed a deep sense of unhomeliness. "We live in a world to which I do not belong any longer" (Lévi-Strauss 2011), he argued, a world in which "the problem of humanism no longer holds any meaning" (in: Kambouchner 2010). Such a dire state of affairs was for him the result of radical shifts in humanity's planetary status. As Philippe Descola and Frédéric Keck have shown, Lévi-Strauss shared with other modern thinkers a mono-naturalistic understanding: humans share with all other beings and processes fundamental material attributes (Keck 2004, Descola 2012). In his view human bodies are composed of the same matter as soils, trees, and non-human animals. And like all other matter we are subject to the laws of thermodynamics and inhabit a world shaped by corruption,

erosion, and an irreversible expenditure of energy. Complex forms always decompose into less complex ones and ultimately into an endless sea of outright deformation. Nature is a vast exterior expanse whose flows are ultimately indifferent to human efforts to arrest the dissolution of familiar realities into less inhabitable forms.

There is, however, according Lévi-Strauss, a way to be exempted from the irreversible flow of time. Some processes could arrest the entropic flow of the world and compose a relatively stable oasis of invariance within worlds in flux. "Cold" or "primitive" societies offered Lévi-Strauss's main example of creative actions through which stable classificatory systems create complex relations between humans, vegetation and animals. For reasons that I will explain in chapter one, Lévi-Strauss believed that monocultures, industrial infrastructures, and capitalist operations brought to an end human capacities to hold back entropic flows. This was one reason for Lévi-Strauss's deeply felt unhomeliness: humanity's most celebrated efforts had sunk all peoples in an entropic morass that is materially adverse to human existence. This is, I claim, an important and overlooked anthropological contribution he made to the study of contemporary global processes. Although the concept is extremely problematic, entropology makes it possible to ponder whether climate politics is carried out, in ways that are broadly analogous to Lévi-Strauss's experience, by people whose most ambitious political efforts involve the design of exteriors that are increasingly indifferent to human existence.

That said, in order to productively use the notion of enthropology, it is necessary to address the profound problems it poses. The term carries conservative and romantic themes regarding the "inexorable corruption of Edenic nature and its indigenous

stewards" under the advance of "downwardly spiraling Civilization" (Raffles 2002).

More broadly, entropology reflects some of the most problematic aspects of the Lévi-Strauss oeuvre: a Rousseauian ethnocentrism (Derrida 1998), indifference to the processes whereby global relations become constitutive of local histories (Wolf 1982), counterfactual understandings of "primitive" temporalities (Fabian 2002), and an under-theorized reliance on modern European ontologies that challenge the study of process and becoming (Turner 1985, Viveiros de Castro 2010, Descola 2012).

Entropology's extreme sense of fatalism (it announces nothing less than the end of anthropology) is clearly contradicted by the fact that Amazonia is a region in which heterogeneous groups continually push political and disciplinary boundaries forward. Today not only anthropologists but also indigenous peoples offer groundbreaking and politically engaged accounts of an extremely dynamic region (Nugent 1993, Ramos 1998, Kopenawa and Albert 2013). Rather than leading to the end of anthropology, Amazonian transformations have inspired generations of scholars to broaden the ethnographic lens as they study phenomena ranging from non-human semiotics to temporal aspects of Amazonian indigenous life and large-scale scientific experiments (Fausto and Heckenberger 2007, Lahsen 2009, Kohn 2013). Fatalism occludes some of the most dynamic and significant aspects of the region's history, politics, and anthropological production. Consequently, *in a strictly theoretical sense, entropology, as Lévi-Strauss defines it, is an indefensible concept*.

Entropology may, however, be anthropologically productive when critically examined as part of Lévi-Strauss's "being there" in his fieldwork in central Brazil (Borneman and Hammoudi 2009). Following anthropologists as Eduardo Viveiros de

Castro, Cliford Geertz, Marcela Coelho de Souza, and Carlos Fausto, I examine Lévi-Strauss's thinking as shaped by his ethnographic experience of Amazonian transformations (Geertz 1988, Souza and Fausto 2004, Viveiros de Castro 2010). From this viewpoint, I claim that his Amazonian experiences challenged Lévi-Strauss to engage with worlds in fluxion that undermined his naturalist project. Realizing that in Amazonia he could not study well-bounded cultures as he initially intended, he used the idiom of entropology to acknowledge the shortcomings of his project as well as to reassure himself that the world was to blame for some of the anachronisms of his efforts. If, as he thought, anthropology was the study of the construction of a human "inside," then it made good anthropological sense to turn away from central Amazonia and stop conducting fieldwork (which he did). There was no anthropological problem in humanity's withering away into an endless exteriors—this would be a task for an enthropologist, and who would want to be one?

Entropology may be productively deployed only when informed by contemporary ethnography and decoupled from Lévi-Strauss's naturalism. In particular, it is necessary to question Lévi-Strauss's assumption that the construction of exteriors is an automatic process that necessarily leads to less hospitable worlds. A revolution, for example, may erode dominant orderings and take a society outside the parameters of social and material existence that under normal circumstances are deemed "familiar." Such revolutionary melting of socio-environmental orders could lead to *more* inhabitable worlds—which is why numerous scholars see in fluxes, processes, and becoming great political potential. But there is also a second, sinister possibility that also escaped Lévi-Strauss: that stable conditions of human existence may be

destabilized in irreversible ways by fluxes thrust forward by humans who are knowingly

and ingenuously creating less hospitable worlds. The challenge for the critical study of

climate politics as I see it is to account for the way in which the planetary dynamics

with which we are familiar are not lost to an automatic tide or to technocratic efforts

that wreck the earth in their efforts to build total insides. Industrial and capitalist

projects today can be seen as shaping climate politics into practices of exterior design

whereby the poorest and most vulnerable populations are exposed to the violence of

climate change—with frightening intentionality, creativity, reflexivity, self-awareness,

and often self-criticism. From this perspective, entropology is not what results from

humanity's drowning in a morass of inertia but rather denotes the cultivation of skills

and dispositions that those taking part in climate politics need to materially build radical

exteriorities. The fundamental premise of this dissertation is that, when taking part in

entropological undertakings, climate policy participants always need to be able to assure

ourselves: "I am okay. I can accept this."

Methods

My analysis of climate politics as exterior design (as the opening of a situation

in which the ideals of increasingly inhabitable worlds whither) implies that pursuing the

dominant eco-politics of today is not a project, logic, or rationality that strives to bring

the planet within a harmonious order. What we witness, I seek to demonstrate, is the

reduction of global environmentalism to a field in which unfettered economic and

geopolitical forces may continue to express themselves. Such a situation supposes

dominant forces, central trends, and ascendant dynamics, some of which yield systemic

arrangements—but it entails no all-encompassing order. A corollary of this approach is

a methodological strategy designed to study a characteristically fragmented planetary situation. I strive to show how REDD+ expresses a disjointed confluence of forces thrust forward by statesmen, Amazonian peasants, environmental scientists and climate diplomats. Instead of working within an over-encompassing theoretical frame of interpretation in order to address these populations, I analyze my ethnographic materials drawing on four ethnographies written by Lévi-Strauss, Philipe Descola, Bruno Latour, and Annelise Riles.

Theoretical affinity was not a factor in the choosing of these four ethnographic pieces and I spend some time clarifying differences I have with some of the authors. More important for me was that these authors completed the ethnographies on which I draw in sites broadly similar to those in which my interlocutors lived and worked (southern Amazonia, rural households, an open-air experiment, and UN forums). I thus seek to establish a link between my interlocutors and the anthropologists whose work informs mine at the level of lived experience. This makes it easier to assume symmetry between myself and anthropologists and non-anthropologists with whom I engage. While I study my interlocutors' assessments of climate politics as statements that grapple with complex anthropological problems, I engage with anthropological texts as responses to the experience of living in puzzling atmospheres. The wager is that pairing my interlocutors with anthropological works sheds light both on climate politics and anthropological research on planetary dynamics.

In chapter one I discuss my work relating Lévi-Strauss to an ethnographic study of Brazilian geopoliticians, and environmental scientists with a focus on *political* problems while providing the historical context of my research. I chapter two I engage

with the work of Philipe Descola to shed light on my ethnographic work carried out with Amazonian peasants with whom I studied the *economic* problems posed by an assumption in environmental politics that humans should be treated as *Homo Economicus*—self-interested animals that respond particularly well to monetary incentives. In chapter three I describe my work on the *aesthetics* of environmental science with reference to Bruno Latour and ethnographic research on environmental scientists who help me answer the question why climate policies are pursued by experts who anticipate unsightly worlds as the outcome of their work. Finally, in chapter four I elaborate on my study of *legal* matters in the work of Annelise Riles and research on climate diplomats—with whom I examine the unravelling of the quasi-religious ideal that a novel ecological order could transcend current socio-environmental predicaments.

The diversity of ethnographic works on which I base my analysis allows me to adjust to the heterogeneous sites in which I carried out my research and account for the various disciplinary fields involved in climate politics. Only by adopting a wide range of viewpoints can I complete the same task I discuss in each of the chapters: the study of practical engagements whose efforts to materially transform planetary dynamics are seen to abrade the conditions under which humans make their lives. Lacking a single theoretical and methodological framework to bring together the various populations with whom I work, my analysis of climate politics is based on concepts my interlocutors used when explaining their participation in ongoing planetary transformations. I introduce concepts such as movement, *mato*, and *bicho ruim*, which I borrow from my interlocutors, interpreting them and applying them to situations that differ markedly from their original loci of enunciation.

My efforts to link these assessments and the variety of sites at which I carried out my research (from peasant gardens in Amazonia to policy forums in Qatar) advance anthropological approaches to the multi-sited study of planetary phenomena (Marcus 1995). Like those who adopt this or similar approaches to the ethnographic study of massive phenomena such as World Systems or modernity, I see my goal as an ethnographer as interpreting a diversity of world-making undertakings from a plurality of locations. Rather than constructing a single picture of climate politics that will become clearer and clearer with the passing of pages and chapters, I seek to understand the various ways in which politicians, peasants, scientists, and diplomats have contributed to earthly transformations. I also seek to identify some points of contact and conflict between these various practical understanding and to capture the resonance of powerful echoes between the experiences of those responding to climate change and the powerful human-bred, non-human forces behind it. The outcome is necessarily a fragmentary picture rather than an integrated, continuous landscape. I argue that the account that follows, in its incompleteness, conveys some truth regarding a shifting and contradictory planet in flux.

Fieldwork Locations

In order to protect my interlocutors' confidentiality I will not disclose the precise locations of the sites at which I carried out my fieldwork in Southern Amazonia. I lived for eight months in rural areas in proximity to two Amazonian villages located in what some analysts call "the deforestation frontier"— a space that until very recently was not densely populated and in which native forests are now being cut and burned to open space for agricultural and ranching activities. These sites are deeply

interconnected with large-scale socioeconomic relations and the peasants, scientists, and NGO officials with whom I worked at these locations often travel to southern villages and cities. I followed my interlocutors to five additional cities that extended my fieldwork site until it comprised a large area wherein more than five hundred miles separated the two most distant cities in which I resided.

The southern border of my fieldsite overlapped with the tropical savannah region in Southern Amazonia through which Rondon and Lévi-Strauss traveled in the first half of the twentieth century. I was not, however, based in any of the cities that stand along the telegraph path (although I did visit some of these cities and carried out preliminary research in them before moving elsewhere for the majority of my fieldwork). As I mentioned, this area features a booming agro-industrial economy dominated by large landholding operations that specialize in expert-oriented soy production. It is also a place in which major scientific institutions and medium-size NGOs are based. Some peasants who live in northern regions occasionally travel there seeking seasonal agricultural work (mainly the soy harvest, which offers important work opportunities). Nevertheless, I spent most of my time in a northern tropical forest region in which ranching is the predominant economic activity. Smaller NGOs were based in cities in this area and, although large ranchers dominate political and economic life, a considerable number of peasant sites dot the region (located for the most part in areas with poor communications infrastructure and unclear land tenure systems).

In addition to this large area in Southern Amazonia, I traveled to four major Brazilian cities for archival research where I also conducted interviews with environmental scientists who specialize in Amazonia. The REDD+ initiatives I studied

link peasants, scientists and NGO officials in Southern Amazonia with a network of scientists based in Brasília, Bello Horizonte, Rio de Janeiro, and São Paulo. I lived for four months in these cities attending science/policy conferences and workshops and visiting universities and research-oriented NGOs in which REDD+ proponents work. In Brasília I also worked at the offices of Brazil's National Colonization Institution (the *Instituto Nacional de Colonização e Reforma Agraria— INCRA*) and visited many of Rio de Janeiro's second-hand bookstores—which proved to be an invaluable repository of seminal books written by mid-twentieth-century Brazilian geopoliticians.

My initial intention was to trace how REDD+ initiatives connected these sites as forest carbon markets went from abstract proposal to concrete implementation. However, at the last UNFCCC meeting I attended, in Bonn in 2013, most of my interviews with climate experts involved the question why REDD+ failed to effect a system of payments as initially promoted. My multi-sited research thus turned into a study of how REDD+'s unraveling represented much larger and longer-term processes whereby powerful forces driving economic and ecological shifts in Amazonia shaped global environmental projects that over the years have become increasingly fragmented and harder to distinguish from geopolitical and economic projects.

Fieldwork Data

From 2010 to 2012 I lived for eight months in rural areas (*assentamentos* or settlements) in the vicinity of two small villages in Amazonia in which two REDD+ initiatives were implemented. Nevertheless, here I write only about one of these places (a municipally to which I refer by the fictitious name of "Jaíli" in order to protect the

confidentiality of the peasants and NGO officials who helped me during my research).

Although the second town in which I lived is not explicitly discussed in this

dissertation, my stay at that place heavily informs my argument regarding Jaíli's history

as it allowed me to identify traits that represent a much larger region of ranching

expansion.

Jaíli is a municipality located in an area of tropical forests that are undergoing

rapid transformations driven by an expanding ranching economy. Some fear (and others

hope) the place will one day soon become a soy-producing area much like those that

can be found some one hundred kilometers to the south (although the agro-industrial

south and Jaíli's ranching economy are closely interconnected). Thanks to the generous

help of officials at two environmental NGOs, I met peasant families at the

assentamentos and built particularly close relations with four of them who hosted me in

their homes and took me along with them as they engaged in everyday and seasonal

activities (including fishing, hunting, planting, harvesting, looking after livestock, and

clearing the forest). I studied the ensemble of such practices and activities as part of a

project peasants call *formar* or "giving form" to a peasant site (an activity which could

be translated as the construction of an economically viable household—but one that

entails much more). While I learned from my hosts how lands are formed so grasslands

may replace forests I became acquainted through their life histories with long-term

Amazonian transformations to which they contributed through painstaking work and, as

they often put it, much suffering. I was thus able to study how peasants see and

experience their role in processes of planetary reach such as global economic flows and

disruptive environmental transformations.

Advancing ethnographic research in an area undergoing such changes poses considerable challenges as the economic and political dynamics I studied often entail illegal practices that those who hosted me could not openly discuss with me despite our close friendships. Although over time I gradually understood Jaíli's most important dynamics, I abstain from writing about economic and political specificities that could make the municipality recognizable. Only by remaining at a highly abstract level of analysis and offering an interpretation that has, in its *formal* qualities, elements of fiction writing, was I able to do justice to the data and offer an accurate picture of a place about which most things shall remain unsaid.

I confronted broadly similar problems when working with NGO officials and scientists whose scientific research and policy interventions at UN forums I do not describe in detail—as this would identify them as well as their institutions. My expert interlocutors however did *not* request confidentiality and the vast majority of those I interviewed thought it unnecessary. However, this precaution made it easier *for me* to ask personal and to conduct the interviews in such a way that climate politics was discussed as a matter of lived experience. I think this allowed me to create a space for the expression of hesitation, doubt, anxiety, and other feelings that play fundamental roles in climate science and international environmental law. As a consequence, I do not use in my argument data regarding personal or institutional connections among the various experts about whom I write. Nor do I draw a more precise picture of the numerous links between particular environmental science research projects advanced in Brazil and REDD+ policy discussions at the UN. Analogous to my work with Amazonian peasants, I offer an image of environmental science and climate diplomacy

that is precise because it conveys the intensity of lived experience and not because it presents exhaustive descriptions.

Over 86 semi-structured interviews I completed in large Brazilian cities I discussed with scientists their contributions to environmental research agendas, REDD+ approaches, and UNFCCC meetings. I talked with my interviewees how the techno-scientific tools they use to visualize possible catastrophic futures in the Amazon (general circulation models, econometrical analyses, and satellite imagery) are changing their understandings of the relationship between human and non-human spheres. I also talked to my interlocutors about anticipating and visualizing intensifying environmental disruptions that suggest that humanity has become a planetary force capable of disrupting earthly dynamics (a point known as the "Anthropocene hypothesis"). During the time I lived in large Brazilian cities I completed two months of research at the INCRA offices in Brasília and closely read prominent books written by Brazilian geopoliticians.

Conducting ethnographic research between 2010 and 2013 at four UN summits on the environment posed considerable challenges. UN meetings are highly formalized encounters in which the most substantive negotiations take place behind close doors and diplomats do their best to keep observers at bay. The lack of personal access is compounded by the dangers posed by the acronym-rich and extremely technical nature of the discussions, which threatens to swallow the ethnographer in the quicksand of endlessly proliferating documents. To counter these problems, at the UN I focused on the same topics I did while living with peasants and talking with scientists. I studied UN rooms as atmospheres that were materially built by persons whose actions were filled

with doubt, hesitation, and anxiety—feelings that convey self-awareness regarding their contribution to global environmental disruptions.

Dissertation Outline

In chapter one, I provide the historical context of the dissertation and substantiate my claim that REDD+ can be seen as an exercise in applied *enthropology* (an effort to endure the melting away of human insides within industrial and capitalist flows). I argue that the notion of entropology conveys Lévi-Strauss's experience of inhabiting worlds in flux and that this echoes key geopolitical writings produced by powerful Brazilian statesmen who were responsible for violent development projects in Amazonia. With the notion of entropology as a touchstone it is possible to assess how Amazonian development projects were proposed in an explicit effort to blur the boundaries between human spheres and non-human phenomena such as geological processes. I show how entropology also makes it easier to understand climate politics as an effort to grapple with emerging and highly disruptive human geologies. Although I do not use the notion of entropology often beyond the first chapter, it grounds a fundamental claim on which my overall argument is based: it is not sufficient to explain contemporary climate politics as the latest moment in the history of Western ecological thought. Given the forces that shape climate politics today, it is necessary to account for the ways in which climate policies such as REDD+ express characteristically non-Western histories (in this case Amazonian) and the material forces therein involved.

In chapter two I describe and analyze the results of my study of how Amazonian peasants fashion characteristically non-Western understandings concerning the forces that weave together (and unravel) the worlds they inhabit. Inspired by the ethnographic

work of Philipe Descola, I study how, while taking part in Jaíli's ranching economy, peasants advanced complex readings of the environment and built elaborate interpretations of worlds in flux. My analysis shows that peasants are not mere instruments of larger political and economic forces, nor do they enthusiastically embrace capitalist developments. Peasants contribute creatively and hesitantly to nurturing political and economic processes they know may undermine their chances of building the sites in which they would like to live. Some of them see their role in capitalist ranching operations as requiring the cultivation of particularly "nasty" forms of being a "human animal." From this perspective, humans would be "nasty animals" insofar as they are equipped with the skills needed to establish particularly violent relations with humans and other non-human animals.

In chapter three I report on and analyze the results of my study of how scientists working at an open-air experiment grapple with worlds they sense to be drifting towards increasingly unsightly and unstable forms. Contrasting my ethnographic findings with Bruno Latour's study of an open-air laboratory in Amazonia, I seek to demonstrate that scientists endured the unraveling of the worlds they studied by cultivating particular aesthetic dispositions. While the work of traditional environmental scientists seemed guided by an interest in the study of Nature as a wholesome composition, the scientists with whom I worked seemed capable of coping with the shock of working within "wilderness without Nature": situations of intensifying and irreversible ecological changes which undermine the idea that it is possible to bring the planet (or regions such as Amazonia) within a beautiful oeuvre.

Chapter four advances Annelise Riles's interpretation of international law as the

weaving of "patterns" composed of bureaucratic artifacts, practices and people. In the chapter I synopsize the recent history of climate politics that led to REDD+ becoming one of the main items at UNFCCC meetings. I offer an interpretation of carbon markets as a process of *unpatterning*: the gradual and creative unravelling of efforts to create authoritative ecological politics. I show how the unpatterning of international environmental law was a quasi-religious effort whereby diplomats at the UNFCC engaged in pseudo-iconoclastic efforts that shattered the idea of Nature and abandoned the idea of climate experts as people in charge of preserving familiar worlds. Taking part in climate politics has become synonymous with expressing deep-rooted mistrust for the higher and the transcendental and having the capacity to breath in the polluted atmospheres of climate exteriors.

CHAPTER ONE
HUMAN GEOLOGY

Introduction

Rondon's building of the telegraph across central Brazil's forests and savannas acted

out modern ideas of progress. As Georges Canguilhem noted, Kant understood progress as

an "Idea," a way of seeing the world that allows persons and groups to "bring into order

empirical diversity" (Canguilhem 1987: 439). For Kant, the idea of progress was a "leading

thread" (*Leitfaden*) that allowed moderns to imagine themselves as part of a natural design

wherein a "germ of enlightenment" would persist throughout time despite the turbulence of

history (*idem*). Enlightened scholars could see catastrophes such as earthquakes and

tsunamis as mere setbacks that, however brutal, could not slow or halt a trend of movement

towards a better future in which humans would render the planet into a more inhabitable

place. Similarly, when facing the baffling heterogeneity of human modes of living, moderns

imagined that an essence lay underneath such diversity and that, under the guidance of

enlightened leaders, human plurality could be transformed into a coherent and wholesome

global community. Comte combined the temporal and spatial motifs of modern ideas of

progress in his description of humanity as an organism that would progressively develop in

a process at the end of which "mankind" would be unified as a single Humanity under the

light of reason (Scharff 1995). A fervent positivist and admirer of Comte, Rondon laid the

telegraph line, as Todd Diacon puts it, in order to "string together a nation" (Diacon 2004).

The dream of unifying dispersed human populations justified to Rondon the brutal work

regime and the challenging living conditions the construction party endured, resulting in

more than 150 deaths by accident or illness.

As a leading thread, the telegraph line was a political project that was intended to alter

the inner fabric of the humans it connected. The colonel and like-minded statesmen imagined the diverse Amazonian peoples that the line connected as occupying distinct places along a single vertical axis of development, with "primitive" Amerindian communities at one end of the line and civilized European societies at the other. The material linking together of these peoples was for Rondon conceived as a civilizing undertaking that would move Brazilian populations "forward" and "upwards" as populations at the lower end of the line adopted European livelihoods and modes of knowledge (Figure 4). The Brazilian flags raised along the line appeared as dots on the unified, Cartesian surface of national cartography while the telegraph stations doubled as missionary outposts in which indigenous populations were introduced to the secular rituals of school discipline and nationalistic faiths (Figures 4 and 5).
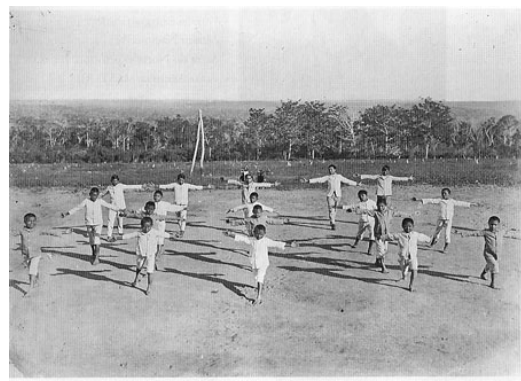
Left: figure 4. Rondon's self-portrait while building the telegraph project.
Right: figure 5, kids from the Parecí training in calisthenics
From: Todd A. Diacon, *Stringing Together a Nation*, 2004.

Standing on the trail while it was under construction, Rondon addressed his troops and described the efforts to which they were committed as a celebration of "the universal Festivity of Humanity" (Diacon: 85). The fallen trees, the path that cut through the green wall of native vegetation, the telegraph poles, the endless string of copper, all these were taken as signs of the progressive completion of the planetary oeuvre to which Canguilhem

has referred as the "humanization of man" (Canguilhem 1987: 44). The telegraphists' ears interpreting electric pulses, their fingers operating transmitters and exchanging messages through copper lines suspended over thousands of miles . . . such a global assemblage of land, technology, and human bodies was imagined as the stringing together of humanity through heroic actions that endured tribulation and transcended the limits imposed by Nature. The realization of humanity as a wholesome form was synonymous with the remaking of the planet into an inhabitable inside conducive to human living.

In this chapter Rondon is a character who represents "naïve naturalism," or the understanding that humanity is a project that may be completed by deploying modern technologies and centralized bureaucratic structures to flee from natural constraints. In the pages that follow, I claim that this form of Western naturalism gradually withered away as state-building projects in central Brazil abandoned the humanistic goal of rendering the planet into a hospitable interior in which diverse peoples could converge as a unified Humanity. I first examine Lévi-Strauss's fieldwork along the telegraph line and show how the Colonel's construction was seen by the anthropologist as an exemplary case of the dissolution of the human. I explain that for Lévi-Strauss it was not possible to do anthropology in central Brazil as this was one of the places in which the human was being eroded, melting away. He suggested that in the absence of the human, ethnographers could write entropology, which I have described as a field that studies geologies in characteristically violent fluxion.

In the following section, drawing on Lévi-Strauss's entropological insights regarding the relation between humanity and geology, I show how it is possible to analyze geopolitical projects advanced in the Amazon basin in the second half of the twentieth century as applied entropology. I show how Brazilian statesmen and geopoliticians successfully advocated for development projects aimed at intensifying global fluxes that

were understood as capable of dissolving the human into a morass composed by soils, rivers, industrial equipment, and communications infrastructures. With Lévi-Strauss, it becomes possible to recognize geopolitical/development projects in Amazonia as efforts explicitly designed to generate an "exterior geology" that was potentially incompatible with contemporary modes of human existence.

These first two sections of the chapter are intended to provide the historical background to REDD+ projects in Amazonia and make it possible to see such efforts as posing complex questions of philosophical anthropology. In the third and last section I explain how REDD+ projects through which landholders would be paid to leave their forests standing are designed and implemented by policy-oriented scientists who, while living in Amazonia, experienced (in ways analogous to Lévi-Strauss) being immersed global machineries that were seen to erode human conditions of existence. Moreover, I make clear that those who created and implemented REDD+ policies also contribute to scientific work on the "Anthropocene," the theory that humanity is a particularly disruptive geological force that has brought the Holocene to an end and propitiated the arrival of a novel, characteristically unstable epoch.

I intend the argumentation that links Rondon, Lévi-Strauss, Brazilian geopoliticians, and Amazonian-based scientists to serve as a genealogy of REDD+ proposals. My goal is to demonstrate that, since the mid-twentieth century, southern Amazonia has been a place in which policymakers and scholars have re-interpreted humanity as geology in the making—instead of taking the positivistic stance of waiting to flee from Nature. This diagnosis is at odds with the views of conventional critics of Western eco-politics according to which flawed climate politics are the result of "naïve" naturalism. In contrast, I claim that the problems with dominant environmental approaches in Amazonia are not related to policymakers' lack of critical awareness or their attachment to old ideas of the human but to

their entropological bent. Addressing my interlocutors as persons who put together complex and self-reflective philosophical anthropology enactments, I argue that REDD+ is an innovative strategy whereby policy-oriented scientists bring themselves into fluxes of global capitalism that generate geological exteriors wherein the conditions of human existence are gradually eroded.

Part One
The Geological Method in Anthropology

Following Rondon's extension of telegraph lines that he hoped would help to modernize Amazonia, Levi-Strauss saw the telegraph less as a signal of human progress than as a window into humanity's melting away. The anthropologist noted that shortly after its inauguration radio telegraphy rendered the lines obsolete and this massive construction project, intended as a gateway to the future, had become "an archeological vestige of a scientific age superseded at the very moment of its completion" (Lévi-Strauss 1955 [1974]: 303). By the late 1930s, the telegraph stations that Rondon imagined would be the first buildings of a new Chicago had become the living quarters of about 100 officials scattered along 800 miles. Without resources or the wherewithal to escape their posts, the telegraph officials Levi-Strauss encountered in his fieldwork seemed to be moving directly away from progress; they seemed to be slowly burning out (*s'éteignaient*), rusting away (*rongés*) from "illness, hunger, and solitude" (*idem*: 305). The world the telegraph created did not seem for him to amount to a meaningful whole as technologies, bodies and signs circulated in ways that entailed the violent destruction of indigenous cultures under "civilization's" oppressive advance. Lévi-Strauss's Amazonia was not the site of the threading together of humanity but one of the locations of its unravelling.

Under the title "How One Becomes an Anthropologist," chapter six of *Tristes Tropiques* contains Levi-Strauss's explanation of how the tremors unleashed by Rondon and others like him undermined the geological interior in which he once thought his anthropological project could be completed. When he left philosophy to become an

anthropologist, Levi-Strauss tells us, he had a profound interest in geology and wanted to use it to inform his anthropological project in ways that led some to see his oeuvre as the ethnological deployment of geology's "methodological canon" (Lévi-Strauss 1955 [1974], Leach 1974). "One of the memories dearest to me" Lévi-Strauss wrote, "is not so much that of my excursions into unexplored areas of central Brazil as that of the search for the line of contact between two geological strata on a limestone plateau in Languedoc" (Lévi-Strauss, 1955 [1974]: 59). In his geological excursion, Lévi-Strauss recalls, he noticed two plants, of distinct species, growing side-by-side in a rock's crevice. The contrasting morphologies of these two organisms, he inferred, thrived in soils whose distinctive chemical compositions suited them accordingly. The plants were indexes for two ammonites within the rock. In the fleeting moment of this observation a "miracle," he writes, took place. He sensed flows of matter that over geological timescales generated stable sedimentary structures wherein chemical flows were captured as nutrients by life forms whose thriving indexed an encompassing order holding together abiotic and biotic entities. Lévi-Strauss sensed himself *inside a world*; he felt all things around him composed a whole that was ready to accommodate him. He wrote about Languedoc:

> Time and space suddenly commingle. The living diversity of that moment [contemplating the flowers in Languedoc] juxtaposes one age and the other and perpetuates them. Thought and sensibility enter a new dimension in which every drop of sweat, every movement of muscle, every quick-drawn breath become as many symbols of a story whose movement is reproduced by my body and whose signification is embraced by my thought. I feel myself immersed in a thicker intelligibility within which centuries and places respond to one another and talk in languages that are at last reconciled. (Lévi-Strauss, 1955 [1974])

The miraculous communion Lévi-Strauss achieved in Languedoc (and failed to reach in

central Brazil) reveled a more-than-human inside that, as Eduardo Kohn would put it, was capable of thought and signification (Kohn 2013). Rocks, flowers, and the human gaze came together within a semiotic system wherein geological stratification and evolutionary dynamics expressed themselves in a "language" that was recognizable to Lévi-Strauss. Like the forests studied by Eduardo Kohn (Kohn 2013: 182–183), Languedoc was unlike a Cartesian empty space in which objects float like billiard balls connected by discrete chains of causation which human minds may reveal from the distance. Languedoc's geological and biological forms were a viscous composite wherein volumes of matter, chemical flows and slowly shifting life forms brought the human mind within a "thick" intelligibility. Lévi-Strauss felt his breath, his muscles, and his sweat as flows of air, blood, nutrients, and water that extended beyond his body reaching out to a geological strata. Miraculously going beyond himself, he did not however reach the higher, ideal realm that his critics repeatedly accused him of seeking. Despite all the time he spent writing about Culture overcoming Nature, Lévi-Strauss found his place inside a muddy geological stratum that integrated "thought and sensibility."

Ethno-geology

Lévi-Strauss's geological method was an effort to bridge the gap between the human and the non-human and create a broad and inclusive geological inside—all while avoiding naturalist determinism. Lévi-Strauss first published his ethnographic work during the heyday of environmental determinism among Amazonian specialists (Viveiros de Castro 1996). At the time, environmental anthropologists interpreted

archeological evidence of centralized sociopolitical structures among Amazonian indigenous communities as an index of the rich soils characteristic of the floodplains. It was assumed that high nutrient availability in floodplains offered greater caloric resources that would allow larger, more complex sociopolitical systems to emerge. Meanwhile, nomadic or semi-nomadic societies were seen resulting from the impoverished soils and scarce resources available in Amazonian uplands (Steward 1946, Meggers 1954). From this viewpoint, humans were not unlike Languedoc's plants: they made their place in the world based on short-term metabolic processes constrained by environmental limits and the "hard" unchanging reality below them. This determinism, espoused in environmental readings, echoed Rondon's positivistic and organicist readings of Society wherein technology was understood to allow human organisms to remake themselves by fleeing nature and gaining independence from Natural constraints. Paradoxically, Lévi-Strauss claimed that in order to achieve such an intimate relationship to the world it was necessary to "repudiate experience" and shift his gaze from the immediate and towards time scales wherein "fundamental properties" and "non-temporal truths" could be identified (Lévi-Strauss, 1955 [1974]: 62).

In response to environmental determinism, Lévi-Strauss situated the human at the level of geological processes—which comprised, but went beyond, the metabolic vicissitudes of organic living. Humanity, he argued, "inherited a history of global geological transformations" and added to it a new, symbolic stratum that was the outcome of the "indissoluble labour advanced forward from one millennium to the next in the work of societies *anonymous like telluric forces as well as in the thought of individuals*" (Lévi-Strauss 1954 [1975]: 62; emphasis added). Fundamentally differing

from a flower whose life is ethereal in relation to the rock from which it feeds, the human is here a process of sedimentation wherein everyday activities and relations coalesce over millennia, giving form to symbolic strata that add layer upon layer, creating a metaphysical veneer over the earth's geological body. In Lévi-Strauss's monist naturalism, the human does not constitute itself as such by a technological flight from nature, but by materially arranging a metaphysical dimension of existence that, within nature, goes beyond transient biophysical existence into a geological, more stable and long-lasting realm.

Lévi-Strauss understood ethnography as the study of human geological labor, the composing of a geological stratum through processes of de-totalization and re-totalization that gave meaning to the world. From a structuralist perspective, he believed that as groups and persons slowly came to know the entities that composed the world, they divided continuous experience into meaningful segments such as birds and worms, warm days and cold nights, rivers and drylands, and so on. These entities, spaces, and processes were rendered discrete and used to establish relations of opposition, contradiction, and similarity among them. For example, Lévi-Strauss saw the Bororo in central Brazil divide the flora and local geography into fragments that were ordered and classified into sets that, while following concrete biophysical traits, responded to symbolic contingency: "trees = land"; "creepers = air"; "marsh-plans = water" (Levi-Strauss 1966: 39). These fragments, sets, and the symbolic relations among them "re-totalized" the world as a meaningful total order, geology-like in its stable form, made of discrete entities that humans connected with one another through relations of homology and contradiction.

Fig. 8. — *L'opérateur totémique.*
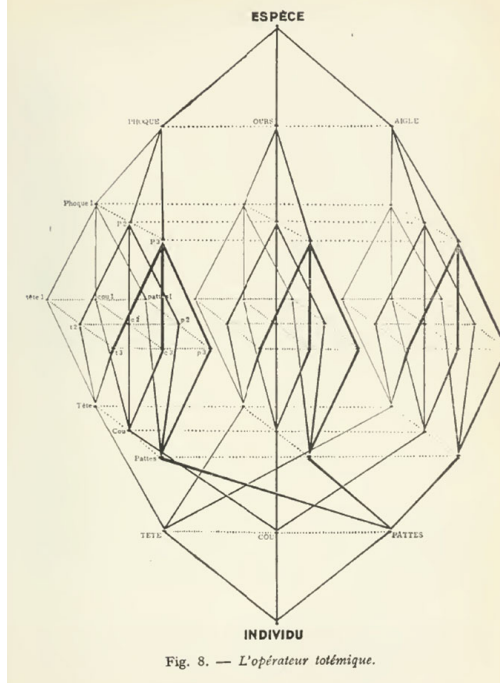
Figure 6. The Totemic Operator.
From: Lévi-Strauss, *The Savage Mind*, 1966 [1962]

One of the most famous examples Lévi-Strauss offered of humanity's geological

labor concerns the Bororos' claim "we are parrots" (*araras).* Such a statement, Lévi-

Strauss argues, should be examined within the context of a "science of the concrete"

wherein *araras* are logical operators in a process of de-totalization and re-totalization

that involves a number of practical actions. *Araras* are studied, domesticated, and

fragmented into meaningful parts. Feathers are procured from them as a significant

fragment. Such feathers are then used to emblazon tools, weapons, and ritual ornaments,

thereby entering into symbolic relationships with other elements of the world. The

Bororo use a combination of feathers and other elements in rituals through which they

symbolize relations of opposition and difference among clans and sub-clans. From the

Bororo perspective, *Araras* were "good to think," they were de-totalized, desegregated

into beaks, claws, feathers, and other parts, and these fragments where then recombined

in ways that allowed the Bororo to ritually symbolize it all into a comprehensive whole. The process of de-totalization, recombination, and re-totalization was seen by the anthropologist as bringing natural and social worlds together into a coherent system built as a bricolage (Lévi-Strauss, 1966 [1962]; 1955 [1974]: 193-233). Although the rules of such a process were never formalized by those who took part in it, they were visible, Lévi-Strauss argues, to those who remained attentive to how long-term processes generated a classificatory logic or "code" that the members of a culture could use in a range of contexts of experience (Lévi-Strauss 1966 [1962], Keck 2004). This code was the geological labor of humans.

Unlike *araras* that could be imagined to fly hungrily from one tree to the next, moved by an automatic quest for caloric-rich fruits, humans are for Lévi-Strauss animals that are driven by the aesthetic pleasure of de-composing and re-composing the world. Rather than taking the Bororo at their word regarding the avian quality of their being, the anthropologist abstracted from native philosophies and, gazing at their object from afar like astronomers would do, strived to unveil the logics of total, concrete, rock solid and cohesive cultural systems (Lévi-Strauss 1968; 1969; 1969 [1962]; 1975). From this vantage point, ethnographic accounts such as that of the Bororo were not meaningful in themselves but were instead the building blocks of a "general inventory of society" that would place the logics of societies from around the world side by side in a way that would be analogous to a "periodical table of the chemical elements" (Lévi-Strauss 1955 [1974]: 160, my translation). Firmly contained within discrete boxes, the "code" of each "primitive" group would be studied as he had examined Languedoc's flowers (which is one possible reason his classic *La Panseé Sauvage* means both *The*

Savage Mind and *The Savage Pansy*). Each "primitive" peoples' logics of de-totalization and re-totalization could be compared so as to find structural regularities that could shed light on how apparently isolated groups influenced one another in large-scale circuits of long-term symbolic exchange (Lévi-Strauss 1952; 1975). More broadly, such a method would allow Lévi-Strauss to examine various cultures as indexes of the human mind which, assumed to be universal in its inner biophysical functioning, would be brought to light as a stable, well-formed structure analogous to a geological layer.

Conceived as a "method of transformations rather than of fluxions" (Lévi Strauss, 1968: 117), Levi-Strauss's structural (geological) anthropology was intended to replicate the ways in which the Bororo were seen to de-totalize and re-totalize the world in aesthetic enjoyment (Wiseman 2007). The anthropologist decomposed the continuous experience of human planetary existence into self-contained cultural systems that he then be re-totalized under the form of elementary (universal) structures of thought. Thus in his oeuvre he sought to compose a planetary inside with enough room to accommodate all cultures that like flowers growing in the boxes of a periodic table would make visible a geological stratum that unveiled a profound communion embracing humans and Nature. Despite the central place that works such as *Mythologiques* occupy in the Western canon, Lévi Strauss failed to achieve his objective of demonstrating that cultural differences made a world that was predisposed to function as human dwellings.

The failure of Lévi-Strauss's project is significant not for what it says about his thought or the history of Anthropology, but for what it says about the history of Amazonia and contemporary climate politics. Although his idea of anthropology as the

construction of something analogous to a periodic table of self-contained cultures may today seem absurd, the inadequacy of his project sheds light on the qualities of Amazonian transformations—whose shifting materiality resisted Lévi-Strauss's geological gaze. I claim that the problems that he faced while seeking a stable human geology may be readily understood once we consider that Amazonia was one of the areas in which humans were in the process of generating a particularly unstable geological stratum as the result of massive industrial infrastructures built as part of an ambitious geopolitical project.

Geological Exteriors

Levi-Strauss saw the steamboats and planes that took him (in 1935 and again in 1938–9) to visit the Bororo as belonging to "civilization," a global machine that was "hot" like the technologies on which it relied (Lévi-Strauss 1969). Steam and internal combustion engines facilitated demographic shifts and intensified material exchanges that liquified self-consistent cultural systems. Singular modes of living were destratified into molecular fragments—images, artifacts, and ideas—whose global combination and recombination could never provide stable, clear-cut differences among total systems. Rather than facing well-formed wholes that could fit into the boxes of a periodic table of chemical elements, the ethnographer faced societies that behaved like unstable molecular composts reacting with one another under the catalytic heat of civilization. Amazonia did not offer Lévi-Strauss a building block with which he could re-totalize the human as a rock-solid formation.

For the anthropologist a world in flux lacking geological stability posed a fundamentally political problem insofar as it led to the progressive concentration of

power and wealth. The advent, intensification, and global dissemination of mechanical civilization entailed for Lévi-Strauss increasingly hierarchical relationships that undermined "primitive societies'" capacity to function as "machines for the suppression of time" (Leach 1974). By defining peoples such as the Bororo as "cold," time-suppressing "machines," Levi-Strauss reversed typical interpretations of "civilization." He did not ask which features allowed groups to build centralized political and economic structures that signaled properly human capacities but instead sought to identify the conditions under which civilizational drives should be halted. His answer was that "cold" societies were the result of concrete efforts and struggles of persons and groups that arrested "time," understood as the drift towards vertical politico-economic systems (Lévi-Strauss 1952; 1955 [1974]; Clastres 1987: 19). Unlike Western modes of living that are driven by self-sustained and increasingly unequal social formations, "primitives" continued to be understood as bearing the singular human power to stay still and create stable sediments that stood as "geological insides" insofar as they preserved islands of difference within a cosmic morass that was drifting towards increasing homogeneity. "Cold" societies, it is worth underlining, were not an automatic outcome but the creative product of struggles to sediment experience in ways that countered Nature's entropic directionality.

Although Lévi-Strauss saw glimpses of geological stability during his stay with the Nambikwara (Lévi-Strauss 1955 [1974], Derrida 1967 [1998]), his trip as a whole was a "sad" one. He saw the tropics under the grip of erosive civilizational processes, a platform on which heterogeneous modes of living were made fluid, discrete cultures eroded, and long-lasting structures desedimented by the "hot" trends of capital and

power accumulation. Under such conditions, Lévi-Strauss reached the conclusion that anthropology, if understood as the study of the covering of the planet's crust with a geological inside, was not possible in central Brazil. The volumes of matter and chains of transmutation within which he found himself as he traveled across central Brazil were rather different from Languedoc's geological interiors. He fussed about how ethnographers reached their fieldwork sites riding the waves of missionary projects, state-building undertakings, imperial efforts, and expansion and intensification of global economic circuits (Lévi-Strauss 1955 [1974]). In the swamps of civilization Lévi-Strauss could not find an "inside" to explore and was forced to grapple with the fact that his own project was possible only thanks to global forces that diluted self-contained cultural units. This is why he suggested, half-jokingly, "entropology" as the name for a new style of writing that would be focused on geologies in fluxion and humanity's condition of unhomeliness. Entropologists would write about what Timothy Morton calls "the end of the world" (Morton 2013), that is, the sense of being immersed in a vast exterior that lacks conditions of intelligibility and stability. The world's end is associated with the suspicion that human and biophysical worlds may not be mutually predisposed to come together in comprehensive and well-ordered forms.

In its technically and conservative romanticism, Lévi-Strauss's diagnosis of the human condition is hopelessly disconnected from Amazonian political projects such as Rondon's telegraph—which responded to the idea that the planet could be made into an increasingly inhabitable sphere thanks to technological deployments. Nevertheless, Rondon's positivistic ideas and his projects for Amazonian development were not at the center of what I claim are some of the most important geopolitical plans to integrate

Amazonia within continental-scale industrial infrastructures. These latter efforts, more similar to Lévi-Strauss than to Rondon, are nowhere made clearer than in the writings of Colonel Golbery de Couto e Silva, a statesman and geopolitician who studied the technological transformations of the basin and considered how these created a new material situation. Like the anthropologist, the Colonel was concerned with unhomely worlds and the liquifying impacts of humanity. I argue in the pages that follow that Golbery's designs can be seen as applied "entropology": a style of bureaucratic writing in the genre of state-building literature that revolves around the question of whether humans may collapse the planet's capacity to accommodate humanity within it.

Part Two
Geopolitics as Political Geology

It took Lévi-Strauss several decades to revisit his fieldwork experience and

produce a manuscript about his trip to central Brazil. When *Tristes Tropiques* was

finally published, Golbery, Amazonia's most influential statesman, was publishing his

own diagnosis of Amazonia's role in humanity's future. His conclusions echoed some

of Lévi-Strauss's concerns regarding liquifying global trends. "We live," Golbery stated

in 1952,

> in a dramatic time for Humanity. . . . Like Nietzsche announced more than half a
> century ago through the prophetic mouth of Zarathustra . . . the human spirit struggles
> against itself, in anguish, lost . . . a renewed dynamism blurs rigid limits . . . between
> madness and brightness, between inert matter and living matter . . . between animals
> and vegetables, between body and soul . . . (de Couto e Silva 1981 [1952]: 152)

Like Levi-Strauss, Golbery addressed Amazonia in a historical moment defined

by global military confrontations and techno-scientific dynamics unknown to Rondon.

The anthropologist lived through exile during War World II and his sense of

estrangement, already patent in the diaries he kept in Brazil, would only increase with

the years. The colonel specialized in geopolitics and made total war the horizon of his

professional life. Neither perspective could accommodate Rondon's humanistic dreams.

Golbery's most influential writings date from the 1950s when he was a university

professor at a military college after quitting the army in protest of what he deemed was

too soft a stance on the part of the military towards left-wing political forces. He was

later a key player in a right-wing group that took control of the government in the 1964

coup de êtat which gave the Brazilian military control over state institutions until 1985.

As the military government's most important ideologue, Golbery created and headed

Brazil's National Intelligence Service. More importantly, he designed and successfully advocated for development projects that drove rapid and violent socio-environmental transformations in Amazonia that, sadly, inspire state development projects in the basin to this day (Child 1979, Schmink and Wood 1992, Fernandes 2009)

Although the long-lasting impact of Golbery's geopolitical thinking is always mentioned in studies of Amazonian transformations, his ideas are quickly dismissed as high-modern rationalistic plans to reduce complex ecologies to "natural resources." The violence in Golbery's geopolitical plans for Amazonia, so the critique goes, lay in his anthropocentric dreams for mastering and exploiting Nature and his disregard for socio-natural dynamics (such as Amazonian indigenous peoples who were decimated as an outcome of his projects). This analysis accurately conveys invisibilization mechanisms at play in Golbery's development proposals whereby the rights of indigenous and peasant communities were systematically undermined to promote the interests of large landholders and representatives of corporate capital (Hecht and Cockburn 1989, Albert 1992, Becker 2004, Hecht 2011a, Garfield 2014). These critiques, however, often caricaturize Golbery's thinking as a botched effort to impose expert mastery over Nature. This reading of the colonel's geopolitical work overlooks his maddening Nietzschean geopolitics and his reliance on "anthropogeography," a field of research that studies how humanity entangles itself with lands, technologies and infrastructures, thereby composing configurations that bear singular military attributes. His writings portray the human as a force sinking into the Earth rather than rising towards a metaphysical heaven. I show that Golbery's political efforts belong in the realm of onto-politics, which is to say, his intention was to transform the texture of the planet to make

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it otherwise and, in particular, to guide the polity towards inhospitable exteriors shaped by disrupting human forces. By reading the colonel's plans as complex and thoughtful projects (however maddening they may be) it becomes possible to explore politics "at the world's end," as a project for advancing the understanding that human modes of living and human conditions of existence may be contradictory. While exploring such issues I bring into the dissertation historical elements and analytical insights that allow me, in the third and final section of this chapter, to examine Amazonian climate politics as part of the history of self-destructive onto-politics in Amazonia.

Anthropogeography

To the best of my knowledge, Levi-Strauss never reflected on the relationship between his fieldwork in central Brazil and geopolitical projects. Rondon laid down a telegraph line across the region because this place, at the geographic center of the continent, had the potential to become an area of continental circulation and conflict. Central Brazil has the Amazonian basin running west-to-east to the north, with the south-bound Paraguay and Paraná Rivers to the south. The area also borders Bolivia and Paraguay. In 1938, when Levi-Strauss visited the area, General Mario Travassos, Brazil's pioneer geopolitician and Golbery's precursor, wrote that "due to its geographic position, the importance of Mato Grosso [in Central Brazil] is such that it could well define Brazil's continental politics" (Travassos 1938 [1945]: 238).

From Travassos's geopolitical perspective, transforming Central Brazil into a space of circulation would transform the country into a dominant power (Figure 7). The general, like Golbery after him, saw the continent as a mosaic of topographic attributes: mountain ranges slowed down circulation and exchange while river basins functioned

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as fluid spaces suitable for the circulation of goods and people (Figure 8). While mountains hampered the consolidation of centralized political structures by limiting the scale at which it was possible to coordinate economic and political flows, river basins were seen to allow the consolidation of complex hierarchies that could attain continental scales and global impacts. In these terms, central Brazil was an area of low circulation that nonetheless had the potential to be transformed by humans into a network of highways and railroads connecting the three aforementioned basins. A space of national circulation could be created with internal combustion engines that would extend and intensify the dynamism of rivers while overcoming the obstruction of mountains. Central Brazil would transform the country into a tightly connected and coherent continental power.
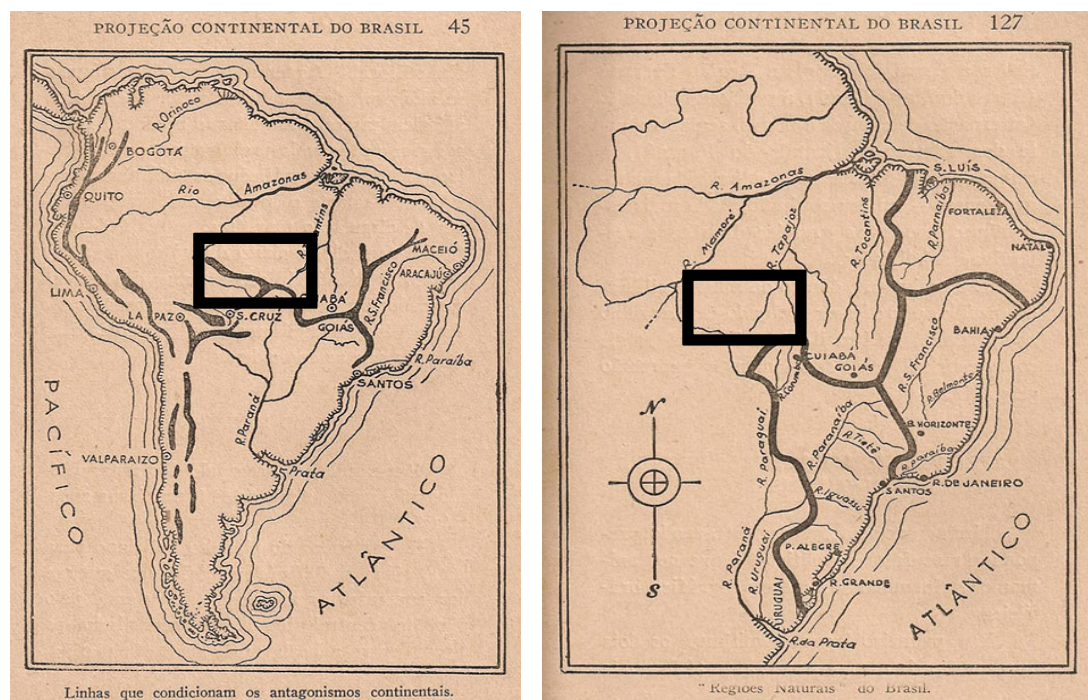
Left: figure 7. "Lines that condition continental antagonisms."
Right: figure 8, "Natural regions of Brazil."
From: Mario Travassos, *Projeção Continental do Brasil*, 1938 [1945]
I added a black hollow square to indicate the region where Rondon built the telegraph lines.

Although at first sight such geopolitical designs may seem like Rondon's dreams of "humanizing mankind" by transcending Nature, the General's plans were *not* expected to be realized thanks to the uniquely human capacity to rationally consider paths of action in order to carve a future that would unfold independently of Nature's constraints. Instead, geopolitical plans to transform central Brazil into a space of fluxion were premised on the idea that humans and geography would have to shape each other. Settlement projects in the area, he argued, would be carried out by "human masses" who the general claimed "conduct themselves as liquid masses, with the same spontaneity of . . . floods . . . *like an ancestral telluric force.*" (*idem*: 189, emphasis added). He argued that his designs for railroads, highways, and air-travel routes were based on what he called "anthropogeograpy," the study of how biophysical and human forces permanently shaped one another. In his classic *The Continental Projection of Brazil*, Travassos described his geopolitical objective as unleashing a human flood (involving agriculture, commerce, industry) that would weave itself with geographical flows progressively expanding river basins and building a more liquid world (*idem*: 186–189). The mechanical, erosive forces mobilized by human masses would sculpt Amazonia in ever-shifting encounters with geographical attributes like a river carving the basin through which it runs (*idem*: 190–191).

Writing two decades after Travassos, Golbery elaborated on geopolitical projects that exhibited a similar interest in immersing the world in flux. He argued that Brazil could become a global power if statesmen projected into its territory the global forces that were currently expanding and intensifying relationships between humans and

geographic traits (de Couto e Silva 1981 [1952]: 58). For the Colonel, the twentieth

century was a time of dramatic acceleration in the planetary flow of information, goods,

capital, and persons. Parts of the earth had become "ecumene," demographically dense

spaces in which industrial technologies made soils into agricultural inputs, rivers into

hydroelectric settings, and the atmosphere into a theater for nuclear warfare (Figure 9).

The ecumene was the name for ever-intensifying human flows that wove themselves

into the planet, melting the world away. This is the world in which Brazil, he argued,

should plunge. "It is a world" Golbery stated,

> in which distances are reduced, where continents become islands or peninsulas, where
> seas become lakes and oceans mix themselves in *a universal sea* in which all physical
> barriers, from waters to mountains to forests and mangroves . . . lose their historical
> significance as insurmountable obstacles. (de Couto e Silva, *idem*, emphasis added)
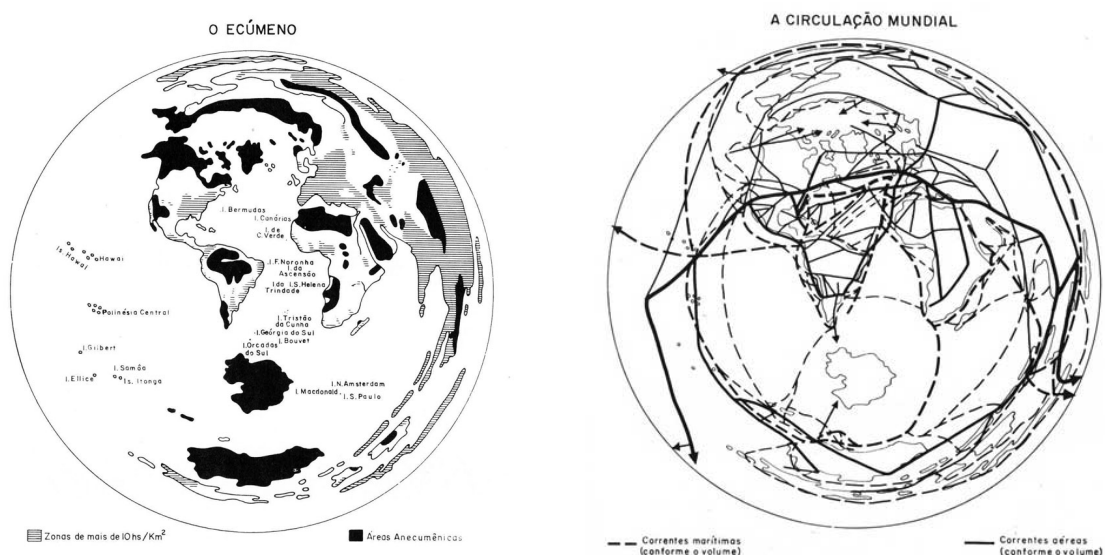
Left: figure 9. "The ecumene."
Right: Figure 10. "The global circulation."
From: Golbery de Couto e Silva, *Planejamento Estratégico*, 1955.

Such worlds in flux terrorized Golbery, who adopted a markedly conservative

stance. Yet he designed plans to further liquify boundaries between peoples, land,

waterways, and machines and he argued that in order for Brazil to become a global

power the country should build industrial infrastructures capable of eroding traditional

livelihoods, facilitating the emergence of urban masses, and contributing to the global

accumulation of power and wealth (*idem*: 230–231). Industrial dynamics were

potentially destabilizing as they could create social situations capable of undermining

what he celebrated as Brazil's Christian and Western stance. Only by taking part in such

dangerous processes could the country successfully struggle against other industrial

powers and achieve unrivaled dominance. His strategy (as he described it in 1952) was

based on comparing Brazil with other large Latin American countries based on four

criteria: population, fossil fuel reserves, hydroelectric potential and steel-production

capacity (de Couto e Silva 1981 [1952]: 54-57). Singling out such attributes suggests a

view of the nation-state as a volume of matter composed of mineral deposits,

waterways, electric power, and people. By considering these elements together the

colonel was able to ponder how to stimulate large-scale experiments that would

combine rivers, industrial combustion engines, fossil fuels, and organized labor to build

massive industrial infrastructures. An important part of such a project was an action he

described as "flooding the Amazon [the Hileia] with civilization" (idem: 47).
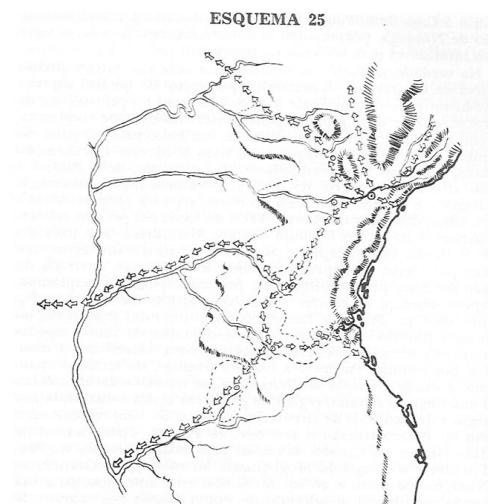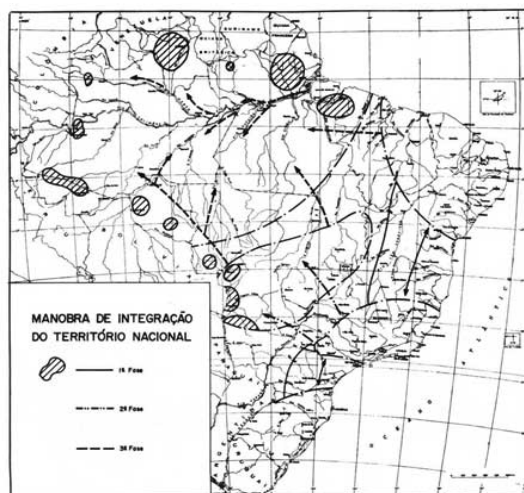
Left: figure 11. "Maneuver for the Integration of the National Territory."
Right: Figure 12. "Scheme 25."
From: Golbery de Couto e Silva, *Planejamento Estratégico*, 1955.

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The "flooding" of Amazonia was at the center of Golbery's "Maneuver for the Integration of the National Territory," a geopolitical project that laid out three steps through which Amazonia would be incorporated into global industrial infrastructures (Figure 11). The first step would be consolidating communications among large urban centers. Then, new paths of "penetration" into Amazonia along areas that would be "permeable" to human presence would be opened (Figure 12). The third step would involve building new urban centers in Amazonia from which further expeditions could be launched (in which case the plan would start over at the first step). Such plans were intended to mobilize human bodies, machines, and inputs so as to turn soils into rural commodities for Sao Paulo and Rio de Janeiro—where industrial modes of living were just emerging. The plan would also allow for increasing exports that could offer Brazil resources with which to acquire foreign industrial technologies. The outcome would bring Amazonia within a global meshwork of transmutations and transvaluations that would advance Brazil's standing in a global geopolitical landscape that the colonel saw as hopelessly self-destructive.

Geopolitics as Onto-Politics

Golbery understood that the large-scale industrial ecologies he sought to build not only would facilitate new modes of living but were also conducive to new modes of dying. His plans to "flood" Amazonia were a response to a perceived geopolitical threat. The Soviet Union could eventually occupy low-density areas in Northern Africa and use airborne warfare to jump across the Atlantic and invade the poor Brazilian northeast (Figure 10). Under Communist control, this part of Brazil would be effectively integrated into the Soviet global war machine and could function as an

"aircraft carrier" from which Communist troops could open a front for the invasion of the United States. In the world of Golbery's geopolitical paranoia, any space that was not integrated into national industrial ecologies could be subsumed into foreign war machineries and used against the interests of the Brazilian state and his Western, Christian allies (Figure 13). In order to contain Communism's global expansion, the colonel thought that the Brazilian state had to do the same that Communists were perceived to be doing: integrate all space within modern industrial networks.
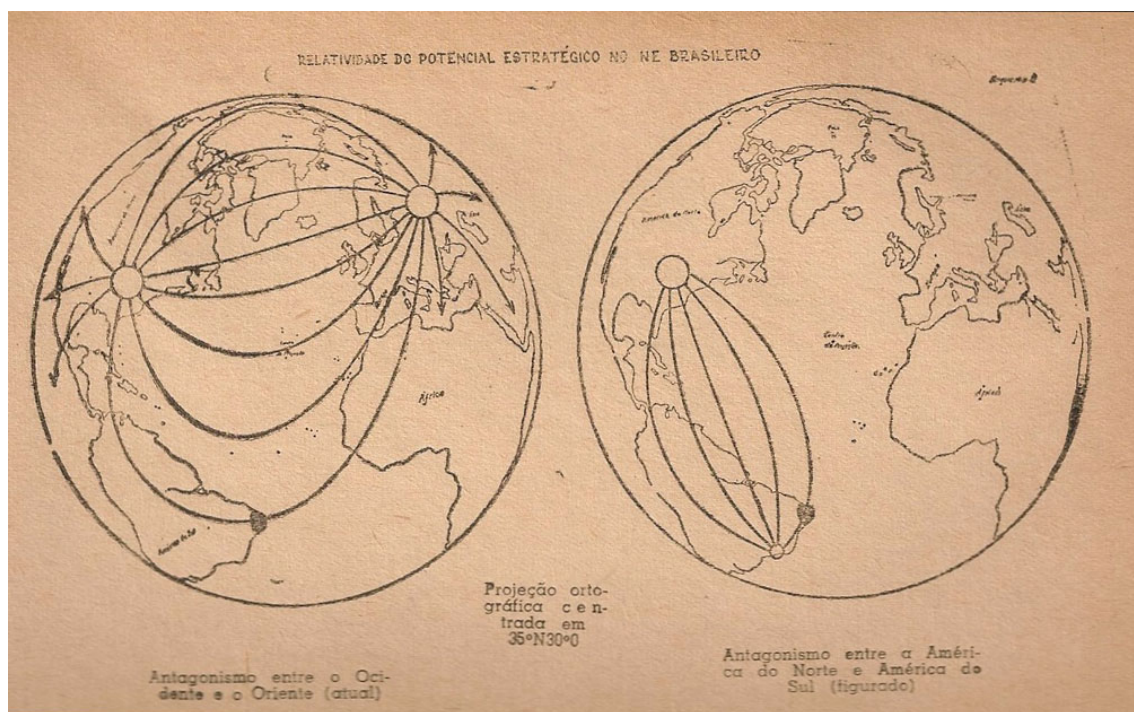
Figure 13 "Relative Strategic Potential of the Brazilian North East"
From: Golbery de Couto e Silva, *Strategic Planning*, 1955

The contradictions inherent to such efforts were clear to Golbery himself, who was aware that geopolitics was one of the fields in which the "renewed dynamism" of the twentieth century "blurred limits" "between brightness and madness." His plans for colonizing Amazonia were part of his "Total Strategy for a Total War," through which he hoped to further Brazil's chances in a kind of modern warfare that, he wrote,

takes place among nations mobilizing all overwhelming forces, all destructive impulses, all the *unchecked primitivism* of the anguished and induced masses . . . total war that engulfs everyone and oppresses everyone, political, economic, psychosocial warfare . . . (de Couto e Silva 1981 [1952]: 12 emphasis added).

The mobilization of "all overwhelming forces" including "impulses," and "primitive" energies was part of a very particular kind of politics whose contradictions Golbery can only describe from an "ontological" perspective. He describes his geopolitical plans as efforts to render state institutions (and the social configurations that support them) into forms capable of constantly making themselves anew. To explain how this might be achieved Golbery mobilizes "ontological teachings" regarding the concepts of "Power" and "Potential" (de Couto e Silva 1955: 220). He argues that, ontologically, a Powerful being is manifested in identifiable acts while a Potent being bears yet unrealized capacities of becoming a new power. While Power is action, Potency is the capacity to act otherwise. Golbery's intention as a statesman was to further the Brazilian state's "capacity of being a different Power," to make it possible for state institutions to carry out an increasingly rich assortment of acts—such as to enter in new economic relations with novel partners, liquefy increasingly vast volumes of matter, and struggle against enemies that threaten the state's "vital conditions" (*idem*).

The colonel justified this onto-political project with the logical violence of tautology. State Power, he argued, was realized in particular acts that established the state as a stable reality. However, such acts of affirmation have always already hosted a seed of Potency insofar as they have shaped and announced the state's future capacities. Inversely, although Potency has remained unrealized, the state's latent capacities have always already been present in particular acts of Power. This is, Golbery argues, the

"scholastic" "mystery" of Power and Potency. They coexist within state power, interrelated but distinct. There is a third figure that in Golbery's design holds together this paradoxical relationship between Power and Potency: "movement." The "movement" or "mobilization" of all resources allows the state to affirm itself as "what is" while at the same time becoming something new (*idem*: 230). Movement entails displacements of matter through acts such as people changing their places of residence, technologies being deployed, and infrastructures built. But the political significance of movement is not exhausted in acts whereby the state moves entities like billiard balls on an empty surface. Golbery aims at a more profound, ontological level and argues that movement radically alters the texture of the world and transforms "actual Power into future Power through the actualization of Potency" (*idem*). Golbery operates here at the limits of meaning but there is value in following his writing. Movement is the onto-political re-ordering of matter that transubstantiates and transvaluates parts of the planet, creating a space for the emergence of new worlds. Such is the case, for example, with the damming of rivers. As the river flow is channeled and the bed is altered, large-scale machinery combines with the water flow and topological gradients to generate energy that is captured by electricity distribution infrastructures. These high-voltage lines deliver energy that is then used to alter human conditions of existence by the building of new highways, ports, airports, mass-industrial installations, new dams, and so on. *Movement* for Golbery is the name for dynamic, maddening actions whereby entities and processes melt into intensified industrial fluxes that feed off their own energy, enhancing the power of state institutions to advance future mobilizations.

The ontological power of the state as Golbery defines it is such that its self-

generating capacities coincide with its self-destructive potential. From his viewpoint, power furthers potency, which furthers power. Dams are built so, ultimately, more dams can be built. The circulation of commodities and monetary resources is promoted so these fluxes can grow as streams endlessly carving an ever-vast riverbed. Preparations for war never cease so the state wins the next confrontation and will be better prepared for the war after that. Such is the profoundly irrational tenor of geopolitical projects which Golbery describes as "the constant, relentless quest for power and more power that ceases only with death" (de Couto e Silva 1955). "But this is the tragic reality of our convoluted age," he writes. "Outside Power there is no salvation" (*idem*: 227). The nations that are more successful in mobilizing all resources within burning "hot" industrial infrastructures would crush those who tried to remain "cold," at the margins of the *ecumene*. There were no safe shores in the universal sea of civilization, no space for neutrality; all parties would finally be assimilated into industrial structures and war machineries. No salvation outside power, Golbery writes—but he knew better than most that, in the nuclear context of the Cold War, there was no inside of salvation either. Swamped in the ecumene, the planet was remade by warring industrial infrastructures into a vast exterior wherein competing masses "could only be awakened," Golbery claimed, eyes wide shut, "in the end, by the fury of *Nemesis*" (1952: 220 emphasis in the original).

With Golbery we are introduced to completely different worlds from those Rondon knew. Through the glass of Western positivism the telegraph-builder saw global politics as an exercise in the art of elevation. By connecting geographically disperse peoples Rondon expected the lines to transmute "mankind" into "humanity," making central

Brazil into a springboard that would enable a "mature" social organism to leave Nature behind. Meanwhile, Golbery drew on Nietzsche, Tönnies, Tarde, Mead, and Lasswell to undermine the idea of Society as the sum of rational individuals whose actions could be harmonized at global scales. He was also critical of the understanding of democracy, technology, science, and civilization as forces thrusting humanity "upward" and "forward." He saw liberal dreams as hypocritical forms of waging total war and sought to be clear as to the irrational character of his proposals for global politics. He described his geopolitical designs as analogous to "socio-psychological epidemics" that submerged groups in aggressive excitement and mystical exaltation. He mentions total war as exemplary of previous irrational undertakings such as the Crusades, capitalist speculation, or the French Revolution (de Couto e Silva, 1955: 116-117). Through this lens, Rondon's telegraph is but *movement* through which human masses are swamped in fluxing matter and gripped by the irrational effervescence of tautological state power.

Golbery's understanding of civilization as the progressive melting of the human in a melting pot of soils, rivers, machinery, war machines and centralized bureaucracies was not all that different from Lévi-Strauss's. Unlike the anthropologist, however, Golbery transformed this awareness into more efficient strategies to compete in the self-destructive process he eloquently described. His onto-politics were aimed at undermining Western global structures from the inside even if this meant partaking in the end of the world. Golbery mobilized "armies" of colonizers into Amazonia as part of a global *coup* that would fundamentally transform Brazil's situation in the world, moving the planet in the process. This would be accomplished through the work of mimetic collectives that, much like Travassos's liquid masses, behaved nervously and

unpredictably shaping the grounds over which they moved and on which they lived.

The Flood as *Coup*

Golbery's designs for Amazonia were first published at a time when political forces from the left and the right advocated for state development projects and large-scale financial and socioeconomic interventions (Ianni 1977). During the 1950s and 1960s, this political climate was manifest in Amazonia under the form of two broad initiatives: macro-infrastructure interventions at the margins of Amazonia (the construction of Brasília and the Brasilia–Belem) highway, and investments in urban infrastructure projects and industries in large urban centers in the basin (SPVA 1960). Besides these punctual undertakings, rogue enterprises were the most active parties in Amazonian development and advanced mining, ranching, and land speculation operations (Cardoso 1977, Becker 1982). After the 1964 *coup*, however, Golbery's designs where adopted and plans were put in place to direct to Amazonia "surplus" populations, landless peasants, generated by the concentration of land and wealth in Southern Brazil where capital-intensive farming operations were expanding (Ianni 1979). Official documents from this period described the region using terms employed by Golbery, as belonging to a national *ecumene* where cheap labor, abundant land and multiple natural resources could be combined to create large-scale industrial infrastructures (Departamento de Colonização 1966, Debelian 1969, Ministério do Interior 1969).

Figure 14. Images from: Ministério do Interior, *Amazonia Instrumentos Para o Desemvolvimento*, 1969
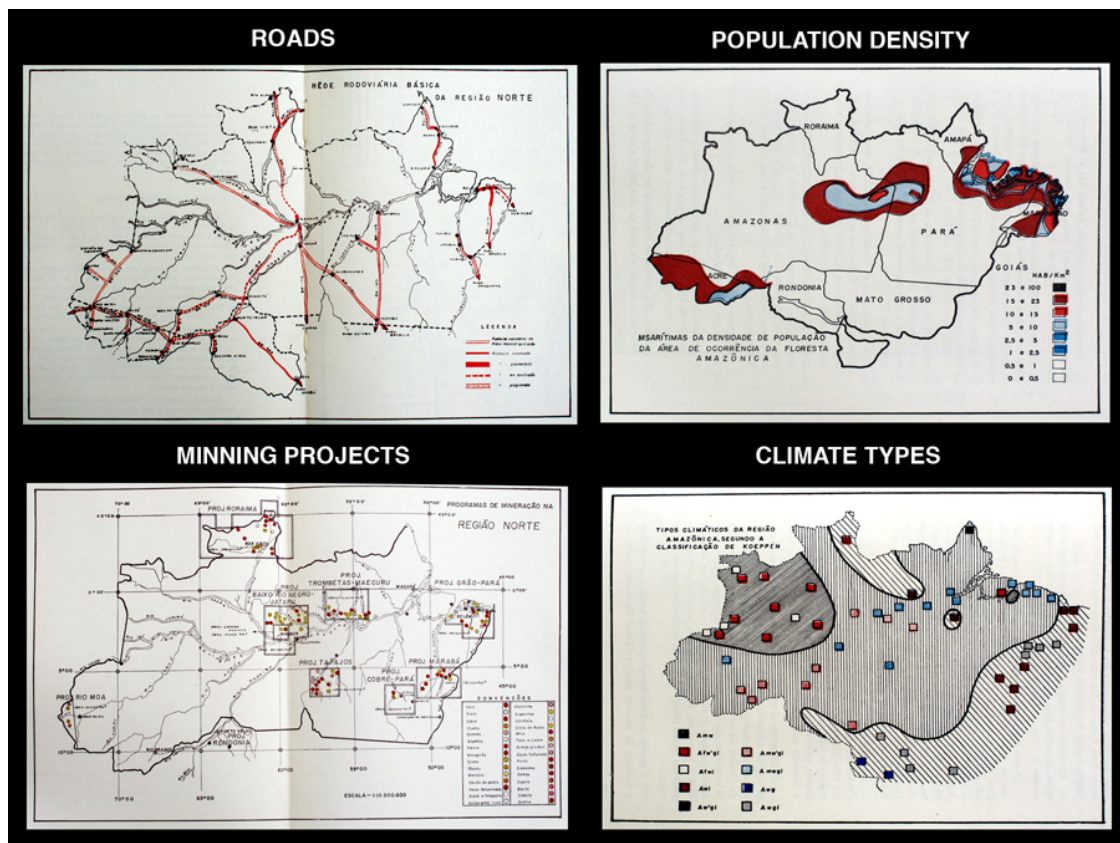
These mass-development projects were initially based on state institutions but eventually involved the same corporate infrastructures that had been deployed in building hydroelectric dams, nuclear energy reactors, ports, and mass-industry infrastructures in Southern Brazil (some of these corporations today carry out macro-infrastructure projects in other countries in Latin America and Africa). The military government first planned for new settlements in Amazonia to be built by state institutions along a new highway system that would "integrate" Amazonia into the national economy. As these projects systematically failed to achieve their goals (Bunker 1985), state developmental institutions met with representatives of large Brazilian corporations who managed tens of thousands of workers and had experience in massive

construction efforts. In private meetings and official documents, state officials promised tax exemptions and cheap credit to companies that agreed to expand their techno-sociopolitical machineries into Amazonia and build mines, cities, peasant settlements, sawmills, ranching farms and other operations (Figure 14,Departamento de Colonização 1966; Ministério de Agricultura 1973).

Like state institutions before them, Brazil's corporations produced vast studies that borrowed heavily from Golbery's geopolitical framework. The plans presented by private colonization enterprises read like a scaled-down model of Golbery's designs, some comprising several large volumes that mobilized cartographic and biophysical studies and explained how corporate machineries would transform Amazonia and contribute to Brazil's macro-economic targets. The actions described in such documents included the introduction of new pastures, cattle species, forestry schemes, hydropower infrastructures, socio-cultural projects to manage indigenous communities, and scientific initiatives to establish agricultural experimentation sites (Grupo Petro Ometto 1976, Grupo Andrade Gutierrez 1977). In all their detail and sophistication, such studies were not intended to constitute a construction manual that pre-figured how investments were to be played out in Amazonia. Their main role was to work as speculative tools ready to the copied and used, with minor modifications, time and again by various companies who sought to fill bureaucratic requirements for tax exceptions and cheap credit (Schmink and Wood 1992).
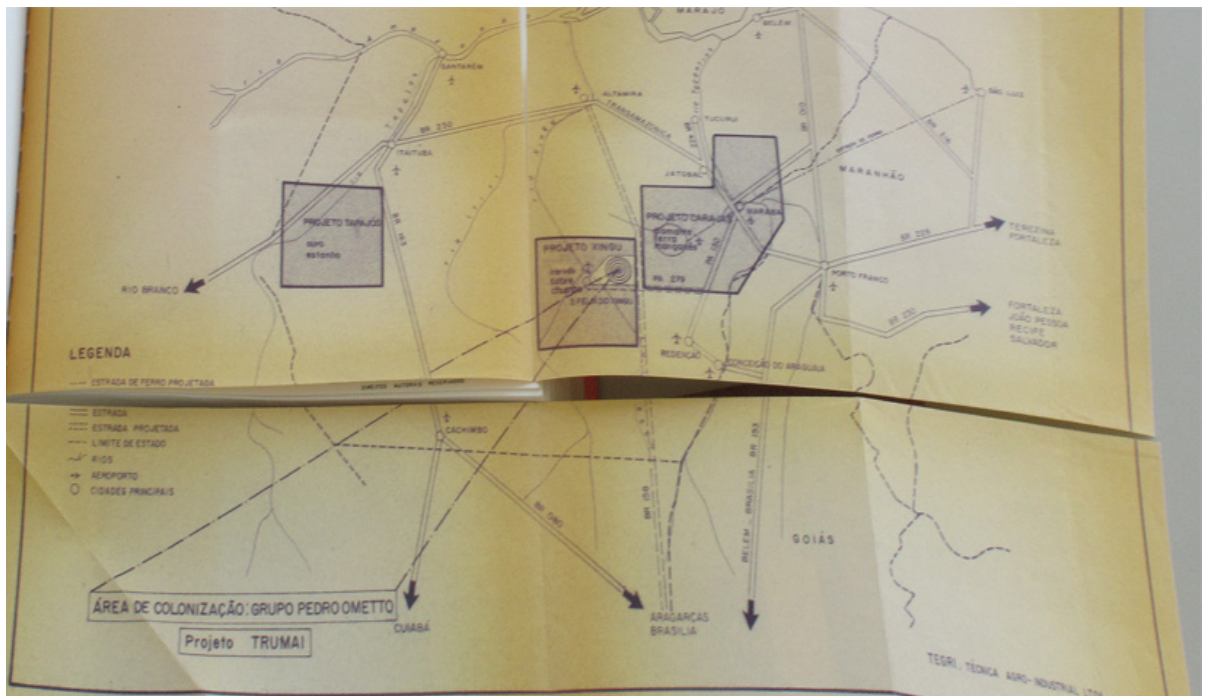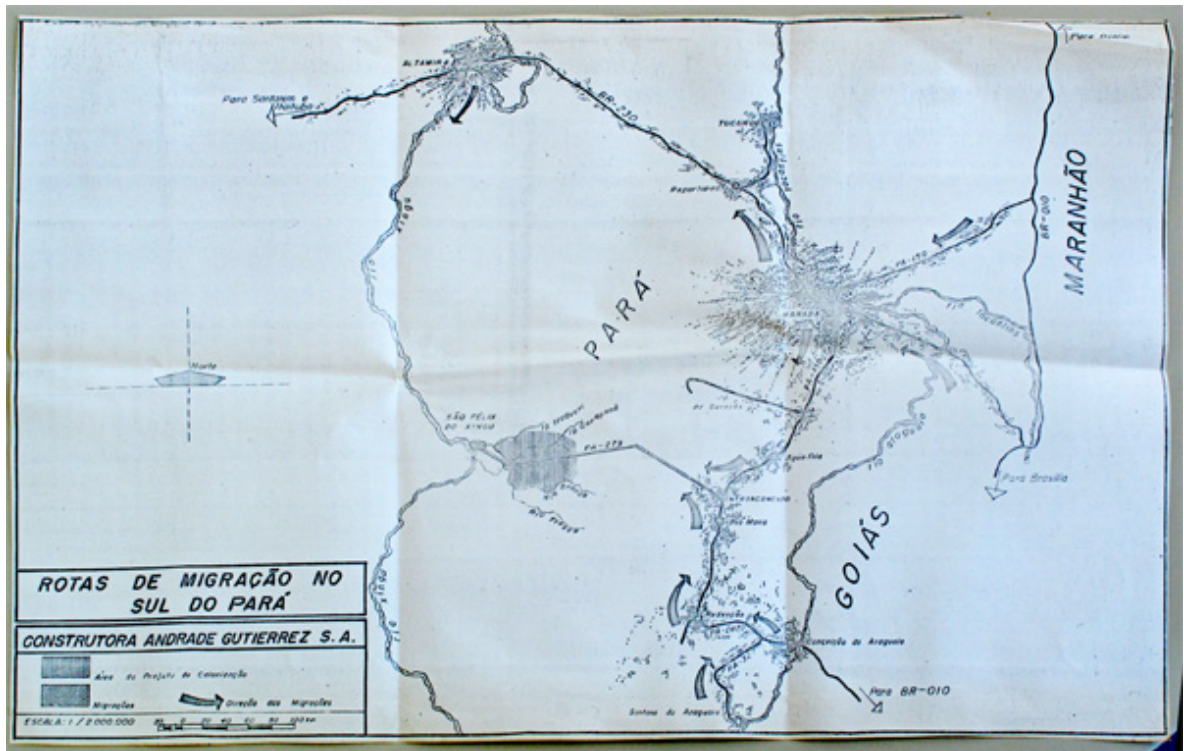
Figure 15. Selected images from a private colonization project advanced by Grupo Andrade Gutierrez, *Projeto Amazônia*, 1977

Such studies were part of a bureaucratic process based on a "project" or "division"

within the corporation. This unit operated in Amazonia through intermediaries (*empreiteiros*) that recruited and managed labor, established relations with the police and the army in support of corporate land-appropriation claims, and managed various conflicts on the ground. As I explain in greater detail in the next chapter, the *empreiteiros* were at the margins of the corporate ladder, knew Amazonia well and were ready and capable of fighting, to the death if necessary, with indigenous communities, rival corporations, or immigrants settled on the company's lands.

While corporations sometimes assumed the role of state institutions in the implementation of violent and irrational geopolitical projects in Amazonia, in the 1970s *empreiteiros* assumed the role of corporations by managing smaller private colonization projects. More often than not large enterprises sold the millions of hectares earned from the government to a multitude of smaller companies, some of them funded by corporate managers on the ground. These smaller enterprises produced documents that mimicked Golbery's geopolitical plans as well as those of corporations, controlled tens of thousands of hectares, and mobilized the state's legal, economic, and military resources. Unlike large private colonization projects, these smaller operations were based in the area and their directors established powerful local political networks—some of them becoming political figures in the municipalities they funded.

These small colonization companies were particularly influential in the areas of central Brazil in which Rondon and Levi-Strauss traveled and where I conducted part of my fieldwork. At these places I took part in conversations in which arguments that echoed Golbery's nihilism were mobilized by peasants and local politicians to make sense of, and explain, their role in ongoing climate transformations.

Industrializing Forests

During my fieldwork in Amazonia I lived with peasant families that, since the 1970s, took part in colonization projects led by relatively small companies that built cities and roads, organized the migration of tens of thousands of people, and together transformed millions of hectares. One night, as we sat chatting outside the house of an old man with whom I was staying, one of his friends, a person I will call Leandro, shared with us a story that echoed Golbery's geopolitical imagination. The story came as a response to my host's having mentioned how sad it made him that, in a region in which fruit trees of various kinds teemed a few decades ago, the dominance of pastures made it impossible to find or buy decent fruit in town. His remarks soon veered into a broader story of worlds that disappeared as settlers like him replaced native vegetation with pastures and farmlands.

My host recalled times not long past, when he and a few hundred others arrived in a forest in which the air was humid, rains were regular, and wild animals could often be seen. All of that, he lamented, was a thing of the past and now peasants like him were struggling to cope with the disruptions to which they had contributed. For example, they were experiencing increasingly strange weather, such as "out of control rains" (*a chuva descontrolada*) that came after particularly strong droughts and caused never-before-seen flooding. But Leandro, who was sitting with us, would have none of such a guilt-ridden account. He was a relatively wealthy man in his mid-sixties who had come to the area three decades earlier—poor and landless like most. He, however, had succeeded like few had, developing a large ranch, and had held a seat on the town's assembly for more than a decade, thus becoming an influential businessman and politician.

"I don't care!" Leandro told my host in a cheerful way, "I don't want to see this forest at all. All of this! I want it gone! I want to see it flooded with cattle and soy."

Leandro's eager remarks brought a parallel conversation among the women to a stop.

"I don't believe you; I already miss the forest," replied my host with a faint smile.

"How do you think rich people got rich?" Leandro quickly retorted,

Ask anyone in Europe and the United States: How did you get rich? And he would tell you: 'My father was rich and he left me a lot of money.' And then you would ask the father [of this person] and he would also tell you, 'Well, I got rich because of my father.' And then you would ask the grandfather, and he would tell you the same. Until you find someone old enough, he would tell you: 'Well, my grandfather killed a lot of peasants.'

"Really?" My host asked, incredulous.

"Yes!" Leandro continued, clearly enjoying the opportunity to tell a story I believe he had recounted many times before.

He would say, 'my father killed a lot of peasants.' Because it was like this: In that time, in the Middle Ages, in Europe, there were *seigneurs*, right?. . . And one day [the *seigneurs*] would say to the peasants 'I declare war against . . . the Kingdom of this and that and I will give [those who come with me] 30% of the booty.' And then an army would form and it would go to war and a lot of people would die. A lot of blood everywhere. And then [after the battle was over] the *seigneur* would say, 'Now I am the new king of whatever. Now I will go against the other Kingdom of I don't know!!! And eventually he would become a really important and powerful King.

By this point in his story Leandro was loudly gesticulating but then he slowed down and gave himself some space to recapitulate the process he just recounted. "There was a lot of killing and a lot of blood. Blood everywhere, and they destroyed all their lands and all their forests. How much forest is there in America and Europe? How much forest did the seigneurs destroy? All of it!" Heads nodded in agreement all around us.

"And now they are all against us, against Brazil," Leandro continued. "They are saying we have to protect our forest . . . in Brazil . . . but we are the greenest country in the world! So when I am rich, I will come to you [looking at my host], and I will say [to

you] 'I will give you U$1,500 [about six times the legal monthly minimum wage at the time] for each month and for each hectare in which you grow your forest again. After you cut it down. You grow it again with all the fruits you want! You can have it all. But you have to create the problem first! . . . If you want your forest, you have to industrialize it!" Leandro's concluding comments were received with laughter as we contemplated the fascinating absurdity of his onto-political proposal.

Chapter 2 is devoted entirely to the issues raised by my host, his doubts regarding Leandro's historical account, his hesitation concerning environmental payments, his partial regrets about the industrialization of Amazonia, and more broadly, to the apprehension settlers felt concerning the violent reconfiguration of the world to which they had contributed. For the time being, I will conclude this section by pointing out that, like Golbery, Leandro understood very well that his geopolitical proposals were deeply contradictory. He knew that to flood the region with pastures and monocrops would intensify unfolding macro-ecological problems and he did not dispute my host's claims that settlement projects had disrupted rain regimes, increased atmospheric temperatures, and dislocated local wildlife. He also understood that emerging environmental crises were likely to bring severe problems for ranchers like him. However, he addressed these dangers in cavalier fashion as a necessary part of the unavoidable global confrontation he was eager to join. Less elegant than Golbery in his description of barren, flooded landscapes, Leandro held in similar contempt interpretations of global politics and economics as lawful edifices that could be progressively expanded so as to bring in and offer comfort to people like poor Amazonian poor peasants who had thus far been used as rural industrialization's cannon

fodder. In his view, politics and economics were another name for processes whose roots lay in murderous and illegal exploitation and land appropriation dynamics. Interpreting all high ideals as masked militaristic projects, Leandro claimed that taking part in global economic relations required advancing violent maneuvers like those of European war machines. And given that environmental concerns about Amazonia were seen as part of a global confrontation whereby Northern powers strived to extend their control over lands across the planet, Leandro thought that peasants should destroy swaths of the forest, build the infrastructures required for global trade, and embark on the industrial business of growing it again. To have the forest was to destroy it with the force of industry.

This violent framing of environmental undertakings assumed particularly unstable renderings of humanity. As in Golbery's writing, Leandro referred to human collectives as molecular structures that would coalesce, thrive, die and dissolve according to the vagaries of militaristic competition. Polities were not moved by high ideals of beautiful designs, but rather by the anticipation of gain, thrust forward by their own growing numbers. Humans were seen, moreover, as a web of forces that shaped the earth and were then transformed by the land on which they lived. It is crucial that Leandro ended the story with a proposal to pay my host to keep the forest standing. Such a plan makes sense in a framework wherein the human behaves as a potentially self-destructive flux that may not be tamed with rationalistic or moral plans. Leandro's plans had little to do with saving Nature and much to do with building a rational politico-economic arrangement. The payments he proposed were intended to work within endless geopolitical confrontations that were in the process of creating an

increasingly inhospitable world. Leandro was not alone in his perception of contemporary environmental strategies. As I show next, the scientists with whom I worked, who included some of the most influential environmentalists working in Amazonia today, had similarly pessimistic understandings of contemporary climate politics. Their environmental plans were ways of grappling with the fact of being immersed in a vast exterior.

Part Three
Geology of Mankind

"I believe we will be able to address and even try mitigating climate change . . .

but this will only take place after a good deal of suffering." My interviewee, an

environmental scientist I will call Derek, talked about dismal futures as we discussed

policy-oriented environmental research projects in which he was involved. This was the

first of eighty-six conversations that, over the course of two years, I had with

environmental scientists—from graduate students to Nobel Prize winners—who at the

time worked at the thresholds of science and policymaking in Amazonia. Some of my

interlocutors designed ambitious research projects so their results could be used by

others in the design and implementation of novel climate policies. Others took on the

role of policymakers themselves and drafted and advocated for climate policy proposals

that were highly influential in environmental forums in Brazil and the United Nations.

Derek and his colleagues are often criticized by academics and other NGOs who

interpret their policies in an effort to assume the role of custodians of worlds over which

they have complete, unrivaled knowledge—and power. Such criticisms are adequate as

long as we see in REDD+ an expression of what, with Philippe Descola, one could call

"naturalist ontological understandings" (Descola 2013: 172-200). That is to say,

REDD+ critics assume that carbon market proposals are grounded on framing the

biophysical world as "Nature": a sum of inert objects, discrete as billiard balls, linked

with one another through chains of causation that respond to invariable laws that

humans may unveil. REDD+ proponents are also understood to believe that experts bear

exceptional "cultural" capacities. Unlike non-human entities that lack "souls" or

"minds" and non-experts from whom Nature's laws remain hidden, REDD+ proponents

would see themselves as uniquely capable of knowing, protecting and improving

regions such as Amazonia. If these assumptions are right, REDD+ would join a long

line of political projects based on systems of expertise that systematically disavow the

failure of their techno-managerial designs and the permanent emergence of socio-

natural entities that cannot be accommodated within the opposing categories of Nature

and Culture (Latour 1993[1991], Ferguson 1994, Scott 1998, Mitchell 2002, Goldman

2005). In other words, REDD+ would be the latest incarnation of Rondon's efforts to

bring the entities of the world into a plan, relatively simple and preordered like

clockwork.

While I draw heavily on such insights, I argue that Derek's comments on the

suffering he anticipated conveys non-naturalist ontological understandings that are

widespread among the policy-oriented scientists with whom I worked. In what follows I

show that these scientists did *not* see Amazonia as Nature but studied it as a reality that

pertains to the "Anthropocene," which Crutzen defines as "the geology of mankind"

(Crutzen 2002). Coined by Paul Crutzen and Eugene Stoermer, "the Anthropocene"

denotes a new geological epoch in which human impacts on the environment have

brought to an end the previous geological epoch of the Holocene (Crutzen and

Ramanathan 2000, Zalasiewicz, Williams et al. 2010, Steffen, Grinevald et al. 2011).

Arguably, the Holocene's relative macro-ecological stability supported ontological

understandings wherein the biophysical world was seen to be a pre-given machine-like

system whose lawful regularities were fundamentally independent of the vicissitudes of

human history. The scientists who claim that we live in the Anthropocene argue on the

other hand that humans have become the dominant geological force and our material

impacts have taken us on a planetary scale out of the Holocene and today we find ourselves in *terra incognita*, a radically uncertain world whose shifting geology is interwoven with the histories of capitalist operations, imperial projects, and postcolonial developments (Chakrabarty 2009, Chakrabarty 2012). All my scientific interlocutors agreed with Crutzen and Stoermer's thesis and some of them published influential articles in which environmental transformations in Amazonia were analyzed as belonging in the Anthropocene. Furthermore, they explicitly agreed with me that REDD+ could be understood as a response to the Anthropocene's political challenges. In what follows I show how these scientists were neither heirs to Rondon's positivism nor representatives of Western naturalism. Like Golbery and Leandro, policy-oriented environmental scientists were not engaged in building monumental interiors that could function as well-regulated greenhouses in which Humanity could progressively affirm itself against a natural background. Pro-REDD+ environmentalists were instead committed to policies that were designed as part of machine-propelled flows that made humanity into a singularly destructive geological force.

Machineries of Rural Capitalism

World-renowned environmental scientist Thomas Lovejoy explained the climate policy approaches I studied at a conference panel in which he spoke alongside agro-industrial entrepreneurs and powerful landed interests from Brazilian Amazonia. Lovejoy reminded his audience of one of the key findings made by the environmental scientists of his generation: the transformation of forests into pastures and farmlands was not only contributing to climate change but also disrupting the hydric cycle in ways

that could increase the likelihood of droughts that could undermine agriculture's macro-ecological conditions (Wright 2009).

These remarks on agriculture's ecological contradictions—fairly conventional coming from an environmentalist like Lovejoy—were accompanied by less orthodox lines of thought. Lovejoy suggested that a REDD+ scheme could be used to cover the expenses of establishing a system of private forest reserves in agro-industrial farms—thus taking conservation efforts beyond areas of "natural preservation." In Lovejoy's proposal, anthropogenic landscapes such as export-oriented soy plantations could be slightly modified to include patches of native vegetation to provide humidity with an "Amazonian rain machine" that would limit disruptions of regional rain regimes (Wright 2009). Lovejoy concluded that such a strategy could incorporate agro-industrial operations into an airborne irrigation system composed of private areas and remaining public forests: "the ultimate global arrangement for planetary management" (*idem*).

By the time of Lovejoy's presentation, a medium-size Brazilian NGO with which I worked had spent years implementing a similar REDD+ initiative in Brazilian Amazonia. Over a two-year period I examined this institution's policy proposals working alongside NGO officials (scientists, engineers, and economists) who understood that environmental degradation in the Amazon was driven by the production of rural commodities associated with global population growth (expected to reach nine billion people by 2050) and expanding middle classes across the world (which entailed dietary changes that increased meat and dairy consumption). In response to this situation, the NGO's officials decided to try an approach that moved beyond creating areas of natural protection. They directly engaged the motors of socio-ecological

transformations in Amazonia: farming and ranching activities. They put together a REDD+ initiative to channel carbon payments to fund technical aid programs destined for hundreds of small and large ranchers and farmers distributed across thousands of square miles. Participants in the program would receive agricultural inputs, tools and training that would lead to increased yields in areas that were already open—thus undermining economic incentives to cut trees in order to increase production and meet global demand. The project's ultimate goals were similar in scope to Lovejoy's proposal: create private forest reserves, promote agricultural development, and limit biodiversity loss, climate change, and disruptions in regional rain regimes.

At first glance, both Lovejoy and the REDD+ project I studied could be seen as an efforts to establish "markets of reparation" capable of "fixing" "natural" crises (Fairhead, et al. 2012). However, in the specific case I examine, such an analytical tack obscures the extent to which scientists are aware of the limits and contradictions of their own policy proposals. Take, for example, the case of a natural scientist I will call Fernando—a senior NGO official working in the REDD+ initiative I just described. Fernando's family migrated to the region when he was a small child—at the height of the violent colonization projects that transformed Amazonia in the 1970s and 1980s. Born into extreme poverty, he worked hard as a student and completed postgraduate training with research on how mining operations in Amazonia released chemical elements that entered food chains and severely undermined human health. Fernando helped run a number of small Amazonian NGOs that formed the backbone of an institutional network by advancing policies in partnership with local entrepreneurs and politicians. On a number of occasions he attended United Nations environmental

summits advocating for REDD+ strategies and established transnational alliances with foreign aid institutions and similarly oriented NGOs from across the world. The massive REDD+ initiative to which Fernando contributed was the outcome of decades of work in Amazonia and an effort to consolidate links between scientific research projects, environmental institutions, and regional political players.

At one point in one of our conversations I asked Fernando to comment on three criticisms his proposals often provoked: first, that they supported emission-intensive global systems of food production; second, that they relied on payments from fossil fuel–intensive economic sectors and companies (Fernando's project, for example, was partly funded by a global mining corporation that had massive environmental impacts and a controversial social record); and third, that such projects handed green credentials to corporate and political forces that, despite supporting some ecological initiatives, also pushed for scaling down environmental regulations. Like the rest of my interviewees, Fernando broadly agreed with the criticisms I presented. "Now, the problem of global capitalism," he added, "now, *that* is a complex problem. And until we can break that [capitalist] logic we don't know . . ." He paused briefly and then tried again. "And as long as we can help and contribute to [breaking the capitalist logics], we will do it. This is what we hope for."

While nodding sympathetically I retorted that critics would point out that REDD+ not only failed to break capitalist dynamics but also reinforced the capitalist logics he had just mentioned. "If you stay outside [REDD+ schemes]" he responded, "other sectors are going to organize and are going to use these resources. I think that the most important thing is to have access [to REDD+ resources] and to organize ourselves

and to enter the mechanism in its own logics." Fernando's description of his REDD+

efforts as going inside a "mechanism" beyond his control sheds light on Lovejoy's

proposal for creating an "Amazonian rain machine." As Golbery would put it, REDD+

proponents did not see "salvation" "outside" global capitalism and therefore

championed policies that could allow them to immerse themselves in boundless

mechanistic exteriors.

Entering Market Exteriors

Mechanistic representations of the world are commonplace in the ecological

imagination and their emergence has been traced to the rise of "industrial

machinofacture" (Worster 1994, Ingold 2000: 294–310). Ingold argues that, unlike

*manu*facturing systems, machinofacture is not organized around the embodied skills

that particular persons cultivate in specific settings but presupposes vertical systems of

authority that determine the coming together of human bodies, raw materials, tools, and

energy. That is to say, the material configuration of relations of production—and the

experiences associated with it—creates the practical understanding of a managerial

domain that is detached from productive operations on the ground floor. Such a gap

between managers (who know how and why the system works) and workers (who are

made to obey, often through force) reinforces naturalist ontological understandings

whereby the world is divided into a "Cultural" sphere in which creativity and authority

reside and a "Natural" pole of passive, instrumental implementation (Ingold 2000).

More simply put, machine-based modes of production create worlds that are conducive

to the emergence of ontological understandings according to which Nature and Culture

are opposite domains (Kohn 2013: 90; Descola 2013: 68-72). Advancing these insights, I would argue that scientists have experienced the expansion of farming and ranching in Amazonia as a fundamentally different undertaking from that of machinofacture. They have seen the transformation of the basin at the hands of Brazilian development institutions, land speculators, rogue entrepreneurs, poor peasants, and multinational corporations as shifting processes that do not express a predefined plan or the linear advance of one single capitalist logic (Cleary 1993, Raffles 2002, Garfield 2014). Amazonia's transformations have been decentralized, unruly, and can be seen as belonging at "frontiers" built through the "mobilization of chaos" (Tsing 2005: 42). Politicians like Golbery or Leandro created a material, socio-natural situation quite dissimilar from that of a machine that could be operated by expert hands.

Towards the end of my fieldwork I attended a workshop on environmental science and policy held in a small Amazonian village. The workshop gathered NGO officials (Fernando included) in addition to students, scientists, and local government officials. Participants held a broad range of political views, and it was not rare for profound differences of opinion to emerge in lively debates. At one point, someone criticized market-oriented policies for being insufficient to guarantee socio-ecological sustainability in Amazonia. Fernando intervened. He stated that his interlocutors had a romantic view that was profoundly problematic and offered an alternative image of Amazonia. He reminded us that his family had to endure abject poverty, that he lived through famine at various points in his life and lost four people in his immediate family to starvation. His reference to personal experiences of extreme suffering and loss underlined the violence in the region's socioeconomic dynamics and allowed him to

depict the basin as something other than a place where environmental utopias could be realized. "For me Amazonia is not this beautiful thing," a visibly irritated Fernando declared.

A few months before the workshop Fernando had told me that his REDD+ project focused on what he called "the agricultural frontier." Poor landless populations, he explained, moved into Amazonia from southern parts of the country where industrial agriculture took most of the land while offering few jobs. Displaced peasants arriving in Amazonia replaced forests with pastures and then used inputs (seeds, fertilizers, and improved cattle breeds) to establish cattle herds. However, only large landholders had the political and economic means to claim large tracts of land and amass enough wealth to establish economically successful farms and ranches. Poor peasants typically went bankrupt, sold their land, and migrated into forested areas where they cut the forest and tried their luck in establishing new ranching sites once again.

For Fernando the agricultural frontier was not a space that could be approached as if it were a machine that could be retooled following an instruction manual. He perceived Amazonia as the metamorphosing sum of non-human dynamics and the efforts carried out by peasants, farmers, and ranchers—each engaged in economic and political competition, each advancing particular strategies to link lands, commodity markets, and agricultural inputs. Rather than using REDD+ to command all these projects and processes, Fernando intended to learn from local populations how to make his NGO one additional party in the flux of frontier expansion. He elaborated on these insights using my own ethnographic project as an example:

> The first step [in our REDD+ project] is to understand. Just like you. You went to live with peasants and tried to understand how [things are] working out in their area. You cannot just arrive and act following your logics. It is *their* logics. Their logics have to

be used by those who come from afar. This is our line of work. [We try] to understand landholders so we can know if we can contribute to their demands.

During my fieldwork I attended meetings in which NGO officials asked peasants, ranchers, politicians, and sawmill operators about the economic challenges they faced, how they responded to such challenges, and what kind of help they could use from the NGO. In agreement with characterizations of REDD+ as "adaptive policymaking" (Agrawal, Nepstad et al. 2011), these conversations determined the use of REDD+ resources to satisfy the various, shifting needs of local populations. Although such adaptive dialogues could be taken as politically correct posturing, they actually required NGO officials to behave in politically incorrect ways. Fernando and his colleagues reached out to, sat with, and learned from players that included global corporations, large ranchers, logging enterprises, and powerful politicians like Leandro who were known for their environmentally damaging projects and illegal land-appropriation enterprises. Although REDD+ projects would also give poor populations more tools with which to take part in capitalistic dynamics, powerful players had the most to gain from such an approach and unjust dynamics were expected to remain fundamentally unchanged. As Fernando's boss explained to me:

> I don't think it is legitimate to criticize REDD+ because it does not solve capitalism's problems. . . . What we can ask from REDD+ is that it does not deepen injustices. And, if possible, that it may help to fix in some measure some of the injustices [of capitalism]. But we cannot ask from it to be an anti-capitalist mechanism. We work within a market economy. This is our vision in this NGO—we work within this logic and we look for ways to be as socially fair as we can.

Despite their massive scale, REDD+ projects were not intended as a blueprint for remaking sociopolitical relations. They were designed to be compatible with dynamic assemblages of migrant populations, land, forests, machinery, seeds, cattle, and wealth. Carbon payments could allow landholders to fight to avoid being swept

away by rival economic forces, instead becoming powerful economic parties in their own right. To be sure, none thought such an approach would "solve capitalism's problems" or avoid environmental disruptions. What participants foresaw was "suffering" rather than horizons of techno-managerial mastery.

Human Biogeochemistry

One of the most frequent misunderstandings concerning the science behind REDD+ is that this policy is intended to preserve forests *qua* "carbon sinks." Critics often argue that REDD+ proponents frame Amazonia as a space that is capable of capturing carbon from the atmosphere and transforming it into tree trunks, leaves, and so on. Therefore, their understanding is that REDD+ is designed to manage Amazonia as a pristine space that could heal the global damage inflicted on the environment by industrial areas of the world. Such an understanding ignores the groundbreaking contributions that pro-REDD+ scientists have made to earth system science. Although some scientists indeed told me that they thought that Amazonia was, *on average*, a carbon sink, others thought it was, *on average*, a carbon source (Lahsen 2009), for an insightful study of these debates). Furthermore, all my interlocutors understood that the really important questions regarding the region's carbon cycle concerned its seasonal and historical variations. Moreover, even those who believed in the region's carbon capture capacities did not think these could in any environmentally significant way offset global industrial emissions.

The claim on which REDD+ is based is that Amazonia, in the socio-historical juncture of the 1990s and 2000s, was a very large source of carbon emissions due to the

expansion of ranching and agriculture operations, the construction of macro-infrastructure projects, and the associated burning of forests. It was not possible for these scientists to think of some natural Amazonia that was independent of the recent history of geopolitical and mass-development projects. The Amazon was trees and rivers and parrots but also highways and dams and mono crops and burning fields. From this viewpoint, reducing emissions from deforestation could have positive impacts on the climate in the same way as reducing emissions from industrial operations might. In chapter four I look in greater detail into how Amazonian socio-natural dynamics were comparable to industrial processes. For the time being, I want to show how these views of Amazonia conveyed mainstream scientific understandings based on shared experiences of worlds in flux.

Take, for example, a meeting I attended at which some of the world's foremost scientists specializing in Amazonia (Derek included) discussed the most important outcomes of recent environmental research on the basin. Meeting participants concluded that the region could no longer be seen as the world's "lungs" that the media or naïve environmentalists had taken the basin to be. "The Amazon is change—" one of them claimed, "changes in rainfall and land use patterns, in soils and waterways." Attendees also argued that their research could not support policies aimed at preserving Amazonia as a well-balanced macro-ecological entity, as those approaches would be incongruous with the dynamic situations they encountered in the field. Rather, for them the main policy/scientific issue was determining how best to address a system in transformation. With these questions looming in the background, the scientists supportively discussed REDD+ initiatives.

Scientists came to see Amazonia as "change" after decades of seeing the worlds in which they worked as composed of planetary-scale chemical flows driven forward by interlinked physical, chemical, and biological processes such as rain, fire, transpiration, photosynthesis, decomposition, and atmospheric circulation. Theirs was a biogeochemical perspective (Garrels and Perry Jr 1974, Westbroek 1991), a vantage point from which they studied, for example, how some of the nutrients and aerosols that were found in the region came from places as remote as the Sahara, how humidity reached the basin from the Atlantic ocean, and how fumes derived from deforestation made air pollution in some areas of Amazonia worse than in São Paulo.

Their biogeochemical vantage point offered particularly vivid insights into links between humans and non-humans. The biogeochemical point was not that discrete human bodies came in contact with discrete things "out there," but that humans and other entities in the world were but instances in fluxes that materially composed them. As soil scientist and biogeochemist Henry Janzen explains:

> If we could follow a single carbon atom now in the air, we might find that it enters a pine tree by photosynthesis, returns to the air when the pine needle decays, then is fixed into a grain of rice, before escaping back into the air in a child's breath. And so the carbon atom flits from place to place, pausing here and there for seconds or millennia, but ever passed along. (Janzen 2004: 400)

From Janzen's and my interlocutors' perspective, the Earth System (and Amazonia as a key part of it) was a shifting, ever-changing composition resulting from molecular transmutations and recombinations. Although from this viewpoint it was hard to identify natural entities that could be neatly cut off from social spheres, for many decades scientists working in Amazonia could still address some geochemical cycles in the region as Nature—insofar as such cycles exhibited stability and temporal invariance. This was the approach taken by Brazilian scientist Eneas Salati, whose biogeochemical

research in Amazonia influenced a generation of environmentalists. With other scientists in his generation Salati conceptualized the region as a volume of matter in which 15–20% of total freshwater on earth circulated together with a vast array of chemical elements. Writing with Peter Vose in the article "Amazon Basin: A System in Equilibrium," Salati explained that forests slowed down global flows of nutrients and water, thereby creating the climatological and soil-nutrient conditions thanks to which tropical vegetation thrived (Salati, Dall'Olio et al. 1979, Salati, Lovejoy et al. 1983, Salati and Vose 1984). Were colonization projects to continue clearing forests, Salati and colleagues suggested, soil fertility could plummet and precipitation patterns might be disrupted, thus threatening to degrade the environmental conditions that allowed forests to exist in their current form (Salati and Vose 1984).

While they celebrated Salati's groundbreaking biogeochemical research, the scientists with whom I worked strongly disagreed with his interpretation of Amazonia as a balanced, invariant system within which humanity could stand as a distinct, exterior sphere. As Derek explained to me, biogeochemists often depict the planet as a web of arrows that symbolize how chemical elements circulate across organisms, soils, air, and water. For several decades now, Derek added, he and his colleagues included in their models of the Amazonia a "human arrow" to represent the global impacts of human activities such as burning fossil fuels or deploying agro-industrial inputs. Not only were "social" flows indistinguishable from "natural" ones, but the regional flow of chemicals no longer exhibited homeostatic invariance. As one of Derek's colleagues told me as we sat by massive agro-industrial fields that extended over what a few years back were Amazonian savannas: "I think that the biggest thing that separates the biogeochemist

[from other environmental scientists] is that we are living in a different kind of world; what we are studying . . . is not the natural cycles, it's how those are being perturbed [by human activities], and without having much idea about the natural cycles themselves."

Paul Crutzen's field experiment "Brushfire" was a landmark in a slow but momentous shift whereby environmental scientists working in Amazonia distanced themselves from Salati's studies which, like those of a generation of scientists, focused on the "balance of nature" (Abel and Stepp 2003; Scoones 1999). In 1979 and 1980 Crutzen's Brushfire deployed planes loaded with instruments over the region trekked over by Rondon and Levi-Strauss and that Golbery sought to transform into a planetary blender. Technicians and scientists literally plunged into heavy smoke plumes rising kilometers into the atmosphere from colonization projects advanced by my peasant friends when they were much younger and made a living burning hundreds of square miles of forests. Writing with Meinrat Andreae, Crutzen explained that, as trees were transformed into smoke particles that rose high into the atmosphere, they became nuclei around which water molecules aggregated. The aerosol particles thus formed not only blocked sunlight and reduced ground temperatures, but also made it hard for larger rain-droplets to form. Crutzen concluded that anthropogenic fires effectively transformed the atmosphere's molecular composition, reduced ground temperatures, and suppressed rains at regional scales (Crutzen and Andreae 1990; Crutzen, et al. 1985).

Unlike Salati, who could still suggest that natural macro-ecological equilibriums could be preserved by limiting human incursions in the region, Crutzen studied worlds whose innermost forms could not be understood without considering destructive human

impacts. Amazonia was one of the places in which Crutzen trained himself in the study of disruptive socio-natural processes. He would become famous for research on how chlorofluorocarbon molecules had opened a hole in the ozone layer—sharing a Nobel Prize for his findings. More politically engaged projects allowed Crutzen to determine in a groundbreaking study how the nuclear confrontations that Golbery feared would unleash a "nuclear winter" as a result of which humanity was likely to perish along with most species on earth (Crutzen and Birks 1982, Masco 2010). The latest in this line of research is his work on the "Anthropocene."

Amazonian Anthropocenes

One afternoon I helped a scientist collect air samples in Amazonian agro-industrial fields. The work was fairly repetitive and gave us much space for talking. At one point I asked my companion if he believed we were living in the Anthropocene. "I gotta say," he replied, "for me it is almost not a question of belief. It just . . . look at how *huuuuge* the impact is. The imprint that we left on earth . . ." He looked around him and I followed his gaze. A flat monocrop field extended to the horizon briefly interrupted by a few patches of green—private forest reserves that could soon become part of a REDD+ scheme. "I gotta say," he went on, "I mean, basically, these things [scientific theories and debates] are always about definitions. It is only words we are using here. But this word, ["Anthropocene"], what it tries to explain for me is nothing else but the fact that we left a mark on the planet and *that* is something that you cannot really deny. You know we *did* that."

For my interlocutors, Crutzen's view of the world as a whirlpool of matter

thoroughly shaped by human impacts was not compelling as a "belief," a truthful

proposition or precise representation. The word "Anthropocene" was a fitting way to

convey the bewildering, undeniable sense of being immersed in worlds in fluxion. In

chapter four I examine how this science–policy approach that operated in a world

barren of beliefs and that was inimical to representation shaped climate policy

discussions at the UN. For the time being, I will explore how the scientists' sense that

they "left a mark on the planet" entails a feeling of exteriority and a rather particular,

"entropological" political approach. Take, for example, one of Derek's close friends and

collaborators, a scientist I will call John. He explained to me that Amazonia's dazzling

socio-natural transformations and the problems of the Anthropocene became apparent to

him in association with experiences that led to radical shifts in his research. John's

initial work as a scientist concerned studies similar to Salati's research on ecological

equilibriums. "We would go into the forest and find ourselves a nice tree and camp

beside it," John told me:

> We measured [the tree] and studied in detail rates of growth. We measured leaves,
> assessed rain patterns, looked into how leaves fell, how they decomposed and became
> nutrients [for the tree] . . . and one day a frog jumped on the tree! And then the frog
> would poop! And we would study how the poop became nutrients for the tree . . . [he
> laughs].

His work on self-sustaining chains of transmutation came to an end in the 1980s

as he lived in the Amazon working as a research assistant whose obligations included

collecting air samples in the forest and sending them to North America for chemical

analysis. One day he received a strange, scalding letter from his laboratory. The person

in charge of sample analysis pointedly asked about his collection protocols, whether he

was still at the scientific base to which he was assigned, and even about his drinking

habits. "Have you escaped to Rio [de Janeiro] to waste the [grant] money on partying?"

Only with time did he fully understand the reasons behind this communication: chlorofluorocarbon molecules derived from industrial processes were found in some of his samples. His laboratory eventually determined that these were not traces of John's lifestyle (the samples had indeed been taken in forests). During summers in the Northern Hemisphere, he explained to me, the atmosphere expands due to higher temperatures, thus altering atmospheric circulation patterns and taking air laden with industrial chemicals from the Northern Hemisphere to Amazonian forests. For John, the experience of finding himself immersed in streams of interweaving industrial and ecological processes was more shocking than witnessing mass deforestation at first hand. He was forced to drop for good his view of Amazonia as a pristine region threatened from the outside and opposed to the industrial North.

When John described the experience of studying worlds in fluxion in Amazonia, he let go of his characteristic wit. While a previous generation of biogeochemists (such as Salati) worked with data gathered at a handful of accessible cities and ports, he and his colleagues, he told me, had at their disposal data collected in ever more numerous urban centers hurriedly built across the basin since the 1970s. As Golbery's project "infected" state institutions, corporations, rogue entrepreneurs, and landless peasants, the more data-gathering sites were established, the more data became available, and the clearer it became to scientists that Amazonia was far from being a monolithic "green carpet." The end of the world, in Timothy Morton's terms, came with its own unashamed transparency. The destruction of trees gave a particularly clear view of the forest, as it were. It also put scientists in challenging situations insofar as what they knew *about* Amazonia changed along with what they felt *living in* Amazonia. John

witnessed firsthand how small settlements emerged in forests and progressively became farms and ranches. Some of these places grew into villages and then cities. He saw areas that were opened during the years in which Fernando's family arrived in Amazonia and over which Crutzen's team flew transform into global agro-industrial powerhouse. Salati could still overlook millennia of human interventions in Amazonia and focus on invariant biogeochemical flows (Baleé 1989, Heckenberger 2005). Scientists such as John, Derek, and Fernando studied the region riding human waves that drove irreversible changes. The movement on which their knowledge was premised placed them in a situation analogous to that of Lévi-Strauss and, as a colleague of Derek and John put it to me, "We will not know what we measure before we lose it."

In order to study worlds that broke apart while scientists were examining them, John had to re-educate himself as a biogeochemist. He learned to use non-linear mathematical tools, remote sensing technologies, and ever more powerful computers in his work. Our conversation, however, revolved mostly around his participation in interdisciplinary research teams that included meteorologists and oceanographers. The latter left particularly lasting impressions on him: "They take off in a boat," John excitedly explained, "and they go for miles gathering tons of data. They travel for weeks and come back home to spend months analyzing all the data they have. And then, off they go again! [He laughs]." Decades after his initial acquaintance with oceanography's unbounded field sites, John was still fascinated by the methods of scientists whose lifestyles seemed as fluid as the forms they studied. Equally influential were the pointed questions oceanographers posed to him: was it not crucial to study how particular sites were only one instance, one moment within broader fluxes and

dynamics?

As Stephan Helmreich has argued, early twentieth-century anthropologists addressed seawater's uncontainable flux as a material and symbolic gap between their home bases and their field sites (Helmreich 2011). The unresting formlessness of seawater represented both a gap between the West and other territories and a background against which anthropologists could see human groups as clearly bounded entities, the kinds of wholes you could fit, as Lévi-Strauss once suggested, into the boxes of a periodic table. In a world thus organized, Helmreich suggests, anthropologists could think about the human as a form about which our knowledge would gradually improve as ethnographers completed ever more frequent field trips beyond Western shores. For John, however, the uncontainable fluxes he learned to study working alongside oceanographers and other like-minded scientists were not contained in the liminal spaces located between the West and the rest, but were spread over the world at large. He was not an expert in the coming together of the human but, like all the characters I have introduced in this chapter, he specialized in humanity's becoming a restless, formless geological force.

Conclusions

Rondon saw his telegraph trail in Newtonian terms. In central Brazil, as in any other part of the cosmos, the day would always follow the night and only humanity could move forward propelled by state-building undertakings that transformed dispersed populations into Humanity rising above Nature. Standing in the same place, Lévi-Strauss saw a cosmos in thermodynamic flux. Eventually even the sun and the stars would consume themselves and the universe would fall into its unavoidable thermal death. For the anthropologist, Nature was a flow that carried all forms, limits, and boundaries towards an absolute exterior of radical homogeneity. Humanity was the most important among a few instances within Nature that had the capacity to swim against entropic currents, as it were, to arrest time, to enforce limits, to build classificatory systems, to arrange the world into an interior that could shelter difference from the morass to come. But humans could achieve this only by dispersing the concentration of wealth and power in the way egalitarian societies—that nurtured complex and diverse cultural and ecological systems—did. From this standpoint, what he called Western civilization, despite all its technological might and rational sophistication, was but a force within Nature's entropic flux. Central Brazil exemplified for Lévi-Strauss the dissolving powers of civilization's entropic power. The region as he experienced it was under a violent process of de-sedimentation that brought it within the flux of a human geology that indexed the end of the human as a sphere that existed independently of Nature's thermodynamic directionality.

Lévi-Strauss's insights clarify the philosophical–anthropological underpinnings of Golbery's geopolitical designs. The General, I claim, enacted a particular position in

philosophical anthropology, one wherein the planet was understood as a permanent flux that was destined to dissolve humanity in an *ecumene* (his name for human geology) made of industrial installations, communication infrastructures, soils, waterways, and machineries of total war. Golbery and those who, like Leandro, shared his geopolitical nihilism, broadly agreed with Lévi-Strauss that "development" brought forward horizons of cosmic catastrophe—perhaps the end of humanity in a nuclear holocaust. But Golbery and like-minded politicians embraced such destiny of *movement* and gave themselves over to carrying great works of civilization (highways, cities, heavy industry) whose ultimate function was to produce further works of civilization. In its material, tautological violence such a restless civilizational cycle was destined to unleash a universal sea that would immerse the planet under flows of commodities, raw materials, energy, organized labor, and war machines. The violence of such a geopolitical project hinged upon the absence of Nature as a sphere that was distinct from humanity. Once nature was gone, politics turned into onto-politics and the only limits militaristic development set for itself were self-destruction.

For its part, Golbery's nihilism sheds light on REDD+ proposals that were designed and advanced by scientists who have contributed to studies of the Anthropocene—the "geology of mankind." As they lived through the socio-ecological transformations championed by Golbery's geopolitical proposals, scientists had to cope with the lack of Nature as a stable background whose lawful regularities they could progressively unveil. Amazonian Anthropocenes entailed shifting fluxes whose geological intensity foreclosed any hope for futures in which the region would become familiar to researchers. Immersed in capitalistic machineries, Amazonia was sensed as

becoming more foreign as humans linked its rivers to dams and electricity grids, its forests to sawmills, and its soils to agro-industrial plantations and global markets. REDD+ was designed for such Nature-less worlds wherein coping with loss was an intrinsic part of scientific and environmental efforts. As a scientific strategy for working in the human-made exteriors of *movement*, REDD+ displayed great onto-political ambitions as it effectively came to terms with horizons of never-ending flux.

As an alternative to discursive genealogies of global environmental politics that invariably lead us to René Descartes, I claim that much is to be gained by approaching REDD+ through a study of how situated experiences of socio-ecological transformations inform global projects. Entropology in this chapter has been useful *not* as a tool with which to unravel how the universal and the particular converge or collide, or how the global and the local meet or diverge. Instead, entropology, the idea of humanity as a destructive geological flux, has allowed me to argue that there is a direct link between REDD+ as a philosophical–anthropological enactment and material histories of environmental transformations in Amazonia. Scientists, peasants, politicians, and an anthropologist were exposed to radically diverse but analogous transformations that led them to think in terms of human geologies in flux. Although this is not a deterministic argument that would "explain" various conditions as "caused" by Amazonian "environments," I do focus on material engagements and how heterogeneous groups respond to them. This allows me to compare responses from statesmen, scientists, and the anthropologist, to identify some regularities and to offer an Amazonian genealogy of REDD+. The broader assumption at play here is that the global is only a name for how Anglo-European issues impact peoples worldwide and

destructive planetary politics is not a monopoly held by the Global North. Taking this point into consideration makes it possible to study situated projects designed to transform the planet into exterior worlds that are indifferent to humanity's conditions of existence (which in itself is a methodological alternative to the study of climate politics as an effort to bring the planet into a Western-normed interior).

In the next three chapters of this dissertation I focus on how peasants, scientists, and climate diplomats took part in undertakings that were sensed as placing humans in situations that were indifferent to the conditions that made their existence possible. The notion of entropology will be used less often and the notion of exteriority will take its place. Although for me "entropology" is still a good term to use in referring to de-sedimentation processes, it is hard to disentangle it from the image of automatic currents that will flush everything away as soon as humans cease swimming against it. The idea of a radical exterior, on the other hand, seems more attuned with the experiences of populations like poor Amazonian peasants living in areas targeted by REDD+ projects—populations whose practical understandings are at the center of the next chapter. As an exterior, the ceaseless movement of worlds in capitalist fluxion has been experienced by poor peasants as harboring the promise of unknown possibilities *and* as carrying the potential to expose disposed populations to the violence of landless living. One can thus see how the construction of such exteriors requires much from humans. Even more so, peasants teach us how exterior architectures are breeding grounds that favor a singular kind of human animal.

CHAPTER TWO
"MAN IS THE NASTIEST ANIMAL"

Introduction

I heard the expression that provides the title to this chapter, *o homem e o bicho mais ruim* ("man is the nastiest animal"), during a conversation I had while living in a rural area 40 miles from a small village I will call Jaíli, in Brazilian Amazonia. Not long before our conversation, the person who defined "man" in this way—an *assentado* (or settler) whom I will call João—cut and burned about an acre of native forest, built a small wood shack, and planted corn around it. The result was a site that, to me at least, seemed beautiful when I first approached it. A small rustic building stood in the middle of a new clearing surrounded by corn stalks whose light-green leaves contrasted against soil that was still blackened by the fire. At a distance, the forest loomed like a wall pushed back by the force of chainsaws and crops. A sight, I first thought, of a promising new beginning (Figure 16). João, however, had a different story to tell and described his clearing as a construction that expressed particularly problematic modes of becoming human.

Figure 16. Corn growing in a recent clearing in Jaíli's *assentamento*, 2010

My first, romantic impression of João's site was influenced by my desire to find there a more optimistic story than those other *assentados* had shared with me over my first month of living in Jaíli. By then I had learned that landless peasants, hundreds of families in total, started to arrive in the area at the turn of the millennium and built this *assentamento* (settlement) through painstaking work, transforming tens of thousands of acres of forests into pastures. Nevertheless, over the past few years the poorest families faced acute economic difficulties, slowly went bankrupt, sold their sites to wealthier landholders, and moved away, landless once again. Like other parts of Amazonia, the region was experiencing an acute concentration of land and wealth and the area was becoming one in which a handful of ranchers and thousands of cows, rather than peasants, inhabited the land.

My hopes of finding a more hopeful story at João's site were dashed as he explained to me how logging and ranching, the very activities that made it possible for the *assentados* to build their sites, added to political, economic, and environmental transformations that made it increasingly difficult to keep their sites afloat. Peasant efforts were captured by large landholders who dominated local politics and pursued policy strategies that did little to help the poorest of peasants. Meanwhile, wild animals were increasingly scarce, rain patterns were changing, the atmosphere was warmer and dryer, and river levels were plummeting to unprecedented levels during dry months.

Environmentalists working in the region were addressing these problems through policies advanced in partnerships with Jaíli's political elites, who were diversifying their operations, establishing forest plantations, and maneuvering to take part in a future REDD+ scheme. Such efforts, João claimed, only reinforced an economic situation that

was particularly adverse for poor peasants like him. While a forestry scheme in town had been used to expand private properties into public lands, carbon payments would benefit only those who had legal ownership titles—effectively excluding all poor *assentados*. Towards the end of our talk João's site seemed a rather fragile construction, barely enduring the pressure of socioeconomic and ecological shifts. "Will it get worse?" I asked. "Yes, it will get worse" he responded, and following a brief silence he elaborated: he expected the changes to continue, the rich to continue expanding their businesses, the poor to continue opening new sites. Even the NGOs working in the area, he told me, had become part of a process that was gradually displacing *assentados* like him. He envisioned a future in which everyone would continue to compete for more and more land and poor peasants like him had little chance of making for themselves a site at which to live (Figure 17). "Man is the nastiest animal," he summarized.

Figure 17. A house in Jaíli's *assentamento*, 2010

In this chapter I argue that the expression "man is the nastiest animal" can be examined as a claim of philosophical anthropology. *O homem e o bicho mais ruim*, João claimed in an off-hand remark, thus posing the problem of how to understand humans as animals (as *bichos*), and as particularly "nasty" animals at that. As I seriously consider such matters I make three main points. First, the construction of the peasant site in Jaíli is an undertaking that, as a component of processes of capitalist expansion and intensification, de-stratifies the worlds peasants inhabit. This is to say, taking part in broad geopolitical movements, peasants see themselves, often with surprise, making things less stable, more fluid, prone to crises. Second, one outcome of the world-melting work being carried out, however unwittingly, by the *assentados*, was the presence of particularly violent relations humans established among themselves and with non-humans. Third, in this context REDD+ initiatives can be seen as problematic not because they impose a foreign "logic" or "discourse" upon a local reality, but because its strategies fit all too well within highly disruptive and contradictory de-stratification processes. Ultimately, with João we can see that the stakes in processes of capitalist expansion (REDD+ being part of them) are fundamentally entropological: the cultivation of skills that render humans capable of bringing themselves into crumbling worlds that promise no solace for the entities they contain.

All these points require understanding that João's comments about this nasty animal, although partly directed against people other than himself, also carried a strong dose of self-criticism. *O meu Deus si eu falar para vôce!*—"My God if I would tell you!"—he exclaimed with sincere concern. "The things I did, the amount of forest I cut down. They would give me money and I would cut it. I would go ahead and cut it."

Although he used the past tense, it was clear to me he was also alluding to his current work. When I met him, a substantial portion of his income came from working for the operations that he knew over the long term undermined his chances of keeping his site. Moreover, João's life history, like those of other settlers, was woven into capitalist processes. He left his home at a young age and had since earned his living clearing forests, mining rivers, shipping commodities, breeding large herds of cattle, and establishing monocrop plantations, among other jobs. In his lifetime he had seen worlds rise and crumble and rise again. He lived in mining settlements that had become large cities, then shrank as their economy dived, and then surged again to the rhythm of boom and bust. With his work he contributed to turning remote villages into agro-industrial hubs that gave birth to global corporations that made Brazil an agricultural superpower.

Nonetheless, despite being at the vanguard of these processes, João was not any closer to securing for himself a place suitable for living than he had been four decades before I met him—when as a young man he migrated from southern Brazil to Amazonia seeking his fortune. His assessment of man's animality was not a denunciation of capitalist dynamics from the perspective of an outsider who struggled against the forces shaping Amazonia's recent economic history. It was rather a critique from the radical exteriors carved by the tides of Golbery's "universal sea" of capitalism. His perspective thus offers unique critical insights into economic and environmental politics that contribute to making worlds that remain foreign and inhospitable to those who inhabit them.

The chapter is divided into three sections. I first offer a broad historical overview of the process of building the *assentamento* in Jaíli. My task in those pages is to show that

João's qualification of humans as nasty animals can be analyzed as a description of the attributes and dispositions that humans needed in Jaíli in order to create what Golbery (and *assentados* in their own way) called *movement*: fluxes of commodities, inputs, machinery and workers driven by large-scale enterprises and rogue economic operations. I show that João's new little clearing in 2010 was but one more ripple in planetary waves and counter-waves of industrial expansion and intensification that had transformed the material texture of Amazonia, thrusting humans into exteriors of boundless capitalistic competition. This initial section concludes with the account of a settler whose life story, I claim, shows that the behavior of humans in the *assentamento* does not respond to a pre-given human animality or "human Nature." Rather, if, with João, we see humans as *bichos*, we may understand their animality to concern self-fashioning capacities that allow them to endure the "extrinsic" situation of life in movement.

In the second section of the chapter I examine in detail interactions I observed between humans and non-human animals during the process of building the *assentamento*. This study draws on Descola's examination of Achuar architecture (Descola 1994). In particular, I advance Descola's insights regarding the construction of Achuar sites as undertakings whereby humans came together with plants and non-human animals in extended webs of social relations. I argue that this ethnographic material may be productively contrasted with the study of how Amazonian settlers weaved their lives together with humans and non-humans as they built their sites—and how they did so through characteristically aggressive relations favored by capitalist ranching operations that were dominant in the region.

In the third and last section I examine how *assentados* engaged with vegetation in Jaíli and how for them Amazonia was not an inert "forest" or Nature but a highly dynamic and contradictory *mato*. This claim is based on a study of a dispute between two brothers who had contrasting ideas about how to build a site they shared in the *assentamento*. The impasse between the brothers allows me to explain that the economic survival of the peasant site depended on settlers' responses to particularly disruptive ecologies. While early in the chapter I argue that there is no "inner" "human Nature" at play in planetary processes of de-sedimentation in Jaíli, in the final section I seek to demonstrate that there is no "outer Nature" that could explain how or why people behave as they do in the *assentamento*. My analysis of the data presented in this Chapter draws on the work of scholars who take a political–ecological approach to the study of how capitalistic operations are intertwined with modes of knowledge and power that shape relations between humans, and between humans and non-humans (Agrawal 2005, Kosek 2006, West 2006, Escobar 2008). I combine this perspective with that of Amazonian ethnologists in order to engage with settler descriptions of ecological and economic shifts in Jaíli as complex elaborations that make it possible to ponder what becomes of the human in unstable worlds in continuous crises. This approach will make it possible to trace the links between peasant understandings of worlds in flux and that of scientists and diplomats who are linked with *assentados* through REDD+ initiatives.

Part One

The Flood in Movement

João first came to Jaíli in the late 1990s as part of a logging crew working illegally

in public lands from which they extracted precious timber to sell to sawmills owned by

local elites. His buyers were rogue entrepreneurs who in the late 1980s bought up

massive tracts of land from a failed colonization project owned by a corporation from

southern Brazil. Before trying its luck in Amazonia, this corporation made a fortune in

international maritime trade logistics and through this experience and political contacts

was awarded several hundred thousand hectares in the late 1970s by the military

government so they could carry out the state's plans to "flood Amazonia." The idea was

that the company's expertise in capitalist trade could be used to link the region to

national and international markets. The company was thus endowed with the power to

build cities, highways, airports, agricultural research centers and other infrastructure

that could serve to promote the industrialization of the area. Ultimately, the company

carried out some infrastructure investments but worked more as a real estate agency

selling swaths of land to entrepreneurs who would eventually offer to complete a

substantial part the original colonization project. João was at the center of this process

and his claim that "man is the nastiest animal" illuminates both the impossibly hard

work that goes into making the world into a whirlpool of capitalist trade and how, after

riding on currents of capitalist de-stratification, humans do not remain the same.

João's most recent clearing project was a direct outcome of his efforts to quit

logging for others and climb up the food chain of colonization undertakings by

becoming a manager of fluxes of capital, people, and technologies into Jaíli. He initially worked as a logger, which entailed not only felling trees but also opening roads and occasionally clearing and burning swaths of lands, sometimes public lands, to be incorporated into large private farms. He and his crew lived for weeks at a time following an ever-moving logging site deep in the forest where they slept in makeshift tents and survived on non-perishable goods and game they hunted. This all changed when João's political patrons presented him with the official maps for a settlement project in Jaíli that had been approved by state institutions years earlier but was never built. João's was one of at least three illegal logging crews that used these maps to transform themselves into land speculators who built the *assentamento* on their own.

The story in the *assentamento* was that, until that moment, the construction of this settlement had been opposed by powerful families in Jaíli for whom uninhabited public lands represented an opportunity to exploit the timber on those lands. However, around 2001 the region received an influx of populations from the south and the northeast as part of a mining boom and land rush and a segment of Jaíli's elites thought it would be beneficial to tap into this demographic change for a number of reasons. First, the migrants would provide abundant labor for clearing larger areas. Second, there would be small peasant sites nearby with pastures they could rent for breeding their calves. Third, the influx of people would alter Jaíli's electoral dynamics by forming a new constituency whose votes could help them challenge rival political factions. And fourth, they could have peasants carry out the dirty work of deforestation and pasture expansion without exposing themselves to possible environmental penalties. To accomplish these objectives Jaíli's elites mobilized their political alliances with patrons

in distant capital cities who obtained the forgotten plans for the *assentamento* and used

their networks of clients to spread the good news among poor and landless peasants

living in southern areas of the country: cheap land was now available for those willing

to move to the forest.

Figure 18. A trail in Jaíli's forests like those used to access the region in which the *assentamento* was
built, 2011

As the settlement maps started circulating in Jaíli and the news of the speculation

undertaking spread, dozens of poor, landless families started arriving at João's logging

site and fashioned it into a large camp in the forest. For two months dozens of people,

women and men, lived 40 miles away from the nearest village in a camp that inched

forward as 80 miles of trails were opened in the dense forest (Figure 18). As newcomers

arrived in the camp, their names were added to a list and they were gradually allotted

plots as the construction project advanced following as closely as possible the map that

bureaucrats had created and then forgotten years before (respecting the map's form was

important to make it easier to transform de facto appropriations into legal tenure).

As the people on the list waited their turn they contributed with their labor to the

construction undertaking and when a family finally made it to the top of the list they

detached themselves from the larger group, built a small campsite by the trail, paid a

sum to the crew, and allowed the local sawmills to exploit some of the timber on their

lands in exchange for allowing them to settle down. At the end of the process more than

five hundred peasant sites had been settled and an area of more than 120 square miles

was opened to timber and ranching enterprises. The project was successful by many

standards. It transformed Jaíli's politics and economics, increasing the region's herd and

thereby contributed to the success of a meatpacking factory in a nearby city in which

the national development bank (BNDES) invested millions as part of its successful

project to render Brazilian corporations into the world's largest animal protein

producers (Repórter Brasil 2011).

Opening the World's End

The *assentamento*'s architectural undertaking was broadly analogous in its

disruptive potential to the "auto construction" efforts that James Holston studied in

Brazilian cities through which disenfranchised populations built illegal neighborhoods

while striving to make for themselves a place within violently unequal social situations

(Holston 2008). In Jaíli the *assentados* did not, from their "place," resist the uprooting

forces of capitalism or introduce "friction" into projects fueled by dreams of seamless

universal communion among the earth's peoples. The people for whom they worked

were *not* like Rondon, dreaming of a global order founded on purportedly universal

principles. Rather, like Golbery or nascent Brazilian corporations, Jaíli's architects were

disruptive powers who saw economic and political structures in terms of relations of

force—rather than as expressions of the world's inner harmony.

For example, one of the leaders of the logging crews that opened the *assentamento*

was born in the Brazilian northeast but learned his trade in Paraguay in the late 1970s.

His first important job was on a massive ranch in which he was employed by a

contractor (*empreiteiro*) that was hired by the state owned by former Nicaraguan

dictator Anastasio Somosa who sought refuge in Paraguay after the Sandinista

insurrection deposed him from power. For one year, he told me, he worked on

Somosa's ranch living a life of superlatives: the pastures he helped establish would

reach 65,000 hectares (more than 160,000 acres) where eventually more than 15,000

head of cattle would graze. The physical hardship he endured at the ranch was rivaled

only by the few excesses in which workers could rejoice. They were paid handsomely

and each was allotted 32 kilograms of meat per month (about 70 pounds). "More than

one kilogram per day!" he underlined, making sure I had my numbers right.

Once that job ended he was hired by Agriex as a contractor and placed in charge of

a small crew. Owned by the U.S. corporation Gulf + Western, Agriex was one of

several foreign enterprises that arrived in Paraguay during the 1960s and 1970s and that,

with the support of Stroesner's dictatorship, transferred land ownership from peasant

communities to large agribusiness operations. (see: Nickson 1981, Hetherington 2011,

Fogel 2012)). While working for Agriex, he learned to operate heavy equipment (tractors, excavators, bulldozers, and trucks) and to lead groups of men clearing forests, extracting wood, and preparing land for mechanized agriculture. The work was hard and after five years his health broke down. The "dust" he inhaled while "mechanizing the land," he told me, led to acute respiratory problems. It was apparent to me that his body, like those of many of my friends in the area, also showed traces of logging accidents or violent encounters with heavy machinery.

Physically weakened, he received news from his father that people were opening Jaíli and that his skills could be used in this land rush. He put his savings to use and returned to Brazil where he assembled his own heavy machinery and crew and tried to become a "big one" (*grandão*) capable of upending political and economic orders by altering demographic patterns, shifting regional ecologies, and mobilizing inputs and machinery. Although he had a brief moment in which this all seemed within his reach, when I met him his best days were behind him and he had joined the majority for whom fortune had proved elusive. "Ask the people in the *assentamento,*" he insisted, probably thinking I was not buying his story; "they will tell you I opened the *assentamento . . .* they may also tell you that I stole their timber. People are always spreading rumors. But they will tell you. *I opened all of this*, this whole area."

The openings built by landless peasants and rogue entrepreneurs had very strange qualities as they promised dispossessed populations a chance to make themselves into the powers that thus far had exploited them. The price of trying to accomplish such transmutation, from landless peasants to wealthy landholders, was exposure to poisonous atmospheres. As the *assentamento* was being built, massive fires burned at

the height of the dry season, when fallen trees are left to dry and then turned into ashes. As a result Jaíli remained under clouds of smoke for days at a time. Those who could afford it moved away for some weeks while others slept in the forest where they sought protection from respiratory illness and the danger of accidental fires spreading into inhabited areas. The thicker the smoke the more fluid the situation and the more opportunities landless peasants had to earn cash working for others, clear large areas for themselves, and fight to turn de facto possession of this space into legal tenure. João himself tried his luck at becoming a landholder and while other members of his crew eventually moved away from Jaíli to open new clearings in other municipalities he quit land speculation to settle down on a plot of his own. For him as for many others, things did not turn out as planned. When I met him he had gone back to working for his old bosses who, benefiting from the demographic change, were "greening" part of their operations and betting on a future REDD+ initiative developed by a regional NGO (the NGO in which Fernando, whom I introduced in the previous chapter, worked).

João and many others in Jaíli often described their situation as being left behind by a massive wave that they helped thrust forward but that created a world that had no place for them. A man I met at a church party in the *assentamento* expressed such feelings in terms that were reminiscent of Golbery's ontological musings. After he learned I was born in Colombia and studied in the United States, he exclaimed in surprise: "But what are you doing here? Jaíli is the end of the world, dude!" In the late 1990s, he argued, when economic growth was explosive there was much more to see: "a lot of movement, everything was in movement" (*muito movemento, todo muito movementado*). This was an expression I often heard in Amazonia that was used to describe desired yet

bewildering flows of people, money, tools, machines, and inputs associated with abundant jobs and opportunities for accumulating wealth and investing in speculative undertakings. Less sophisticated than Golbery's definition of movement as the re-ordering of matter that creates a space for a special kind of power capable of bringing about more extreme re-orderings of matter, this definition of movement reflects how industrial flows can transform the texture of the worlds that poor people inhabit.

In Jaíli, however, as I was told in the aforementioned conversation, movement was a thing of the past as large ranchers had consolidated their operations and no longer needed to hire as many people as before. Moreover, environmental operations against illegal deforestation made it hard to open large new ranches on public lands and the possibilities for land speculation were closed for those who, like my interlocutor, were not well connected. He now lived on a small farm that provided little income and earned some extra cash from intermittent wage labor. It was all very slow now, *muito devagar*. He was preparing to leave Jaíli altogether. "And go where?" "Deeper into the *mato* [forest], to the north," he argued, to an area where illegal logging was still thriving and where there was more money to be made. His family would stay here and he would send cash back, returning only after some months or years—or send for his family to join him. I knew from others that some people like him never come back and just disappear altogether. His uncertain plans, defined by luck, were based on the sense that it was better to take risks in more remote lands than to stay "at the end of the world" where lack of income could force peasants like him to sell his land and end up with nothing at all.

Figure 19. A road in Jaíli's *assentamento*, 2010

I was struck by the paradoxical topography of his plans. While he lamented that I

had ended up studying the "end of the world," he himself was interested in migrating to

areas that were even more remote than Jaíli. Was it not, I asked him, only after years of

hard work, pushing politicians in town, and trading votes for political favors that half-

decent bridges had been built allowing a bus service to the village to run twice a week

(reducing an all-day 40-mile walk to the village to a three-hour ride)? And what about

the recent construction of the school and the health facility, or the arrival of electricity?

Was it not only within the last year that living conditions had become good enough for

families with small kids to move in? To this he answered that I was right and explained

that he was going to a place with no schools, no good roads, no bridges, and no electricity. Yes, he said, Jaíli today was "structured," using a word that alluded to areas that enjoyed some amenities of urban living (Figure 19). But only those who made it big could rest assured that their operations would not go broke as tenure systems were consolidated and environmental law enforcement materialized. For most people dreams of success came only in de-sedimentation, within the movement that felled trees and burned land while giving those who had courage (*coragem*) an opportunity to put up a good fight and try to transmute fact into law.

Frontier Architecture

Ann Tsing defined the "frontiers of capitalism" as an "environmental project" that hinges upon the work of bureaucrats and generals whose legal/bureaucratic innovations and material interventions transform rural settings into "resources" that are "freed up" from customary arrangements so they can be "captured" by state and corporate operations (Tsing 2005). Critical scholars writing from this perspective underline how the construction of such environments (what I call de-sedimentation) advances as development projects frame the world into a collection of discrete and commensurable objects that can be mobilized, by force if necessary, by humans who may likewise be arranged into forms that fit within global capitalist operations. According to this literature, capitalist projects are supported by the rationalistic dream that a desirable world is one in which the planet becomes a sphere of seamless economic transactions that houses self-interested individuals whose actions express their egotistical drives, their "human nature." The prototypical argument in this regard would be that of Francis Fukuyama, who claimed that representative market democracies allowed the coming of

"the last man," a figure he described in the form of settlers remaking the world as they strive for wealth and recognition (Fukuyama 1992). Critical scholars show that these plans fail to acknowledge that the world is not inhabited by the subjects they suppose nor does the materiality of the planet respond to the idea of Nature on which Western rationalism is premised. The human world, these critical voices argue, is not constituted by isolated rational individuals, while the non-human world is more uncertain and creative than those pursuing capitalistic initiatives are ready to admit. Consequently, projects designed to create a planetary sphere of economic circulation are, rather than expressing Nature's designs, shown to transform humans and non-humans into the entities that Westerners pre-figure in their rationalistic dreams (Agrawal 2005, Kosek 2006, Li 2007, Escobar 2008).

Although these critiques accurately convey how de-sedimentation projects profoundly alter the fabric of the worlds they bring into movement, I argue that "the flooding" of Amazonia stands at odds with the focus of these analyses on the rationalistic imprint of capitalistic projects. In Jaíli, de-stratification projects were never seen as strategies for creating an all-inclusive global order. Neither when Golbery put his geopolitical designs on paper nor when large corporations drafted colonization plans nor when these were appropriated by poor peasants like João were bureaucratic documents thought of as expressing a Natural order or a representation of a more perfect future state of affairs. Instead, such documents were tools of combat, intended to inflame masses into action, to elicit dreams of fortunes to be made, to make way for illegal operations capable of destabilizing economic and political structures (at local, regional, national, and global scales). Rather than serving to impose a clear notion of

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what is or could be, these documents enticed humans to embrace radically uncertain horizons, from Golbery's horizons of total war to the rush for land in Jaíli, on which generals, corporate officials and rogue entrepreneurs could capitalize. Rather than conveying the rationality of the world, these colonization projects unveiled the arbitrary character of law, the political efficacy of brute force, and the contingency of socio-economic structures.

Rather than a design imposed upon those who lived in Jaíli, the construction of the *assentamento* was a poorly coordinated, subversive effort carried out by people who against all odds strived to undermine political and economic orders and create a more fluid and uncertain reality. This case, therefore, challenges us to consider whether, unlike discursive critiques of capitalist projects would have it, capitalist behavior (self-interested, individualistic, accumulation oriented) is not merely a fantasy of technocratic designs. Nevertheless, this in no way means that Fukuyama's claim (that humans are by nature egotistical, self-interested and power-driven animals) is substantiated by Jaíli's history. In other words, the analytical challenge is to recognize that capitalistic behavior is not a discourse imposed upon the *assentados* but that, at the same time, neither are bottom-up capitalistic projects the expression of an "inner nature."

Tsing offers an important insight in this regard when, writing in a style that echoes Golbery's, she describes frontier architecture as a project advanced by contagion rather than by discursive dissemination. She argues that a frontier is not a contiguous space nor does it bring about a temporality of regular progression. It would be wrong, for example, to imagine the places opened by logging crews in the *assentamento* as ink spilling on paper—a spot gradually expanding from a single center and engulfing all

that is on the page. A more appropriate figure, she suggests, would be that of swirls of smoke that irregularly advance over a volume of air, retreating, holding together, intensifying, or withering away. Such heavy air is bewildering and often intoxicating as it confuses, she writes, "the boundaries of law and theft, governance and violence, use and destruction" (Tsing 2005: 27). The words are Tsing's but could very well be Golbery's. In frontier worlds *Homo economicus* would soon perish as its self-destructive potential would undermine the stable atmospheres needed for cost-maximizing calculations. *Pace* Lévi-Strauss, self-interest and egotism cannot be properly studied by focusing on how individuals are trapped (or freed) by abstract capitalist "logics." The clue lies in the materiality of smoke-laden air and polluted atmospheres.

Tsing's emphasis on the atmospheric conditions of frontier expansion signals a way forward as she underlines the importance of acclimatization. While advancing their entrepreneurial projects, settlers like João built "openings," locations in which humans exposed themselves to singularly violent relations they established with humans and non-humans. The construction of such spaces entailed hardships and violence and demanded acclimatization to the polluted and inhospitable atmospheres of capitalist expansion. Such actions never came naturally and those with whom I worked did not see their own exploitive and self-interested behavior as the joyful expression of their dreams and desires. If indeed they had become a rather peculiar, capitalistic kind of being (a nasty animal), this required constant self-fashioning without which they would not have been able to become experts in building unstable and inhospitable worlds.

Renato's Birds

As a word that denotes situated engagements, "acclimatization" is easier to understand by looking more closely at the process of frontier architecture in Jaíli. Take, for example, an *assentado* I will call Renato whom I met as we were both were waiting for the bus between the settlement and Jaíli. He introduced himself with an odd question: "Do you have a tape recorder?"

Renato was in his seventies, lived about a mile away from the peasant family with whom I lived at the time, and was well-known for the role he played in the construction of the settlement a decade before I met him. Together with his four sons, Renato led one of the logging crews that opened the settlement and this work earned him considerable money and influence. But when I met him his fortune was but a memory. His sons had all gone to work opening new *assentamentos* in areas to which settlers were just arriving, but he stayed behind, too old and tired to migrate once again. His wealth and influence had slowly dwindled along with his physical strength and he lived in a dirt-floor wood shack in a remote area of the *assentamento*, surviving off a small state pension which he spent mostly in the company of his drinking friends.

After I explained to him that I did not have a recorder I learned that he wanted one so that he could "make a record of the birds." Renato, it turned out, enjoyed the singing of animals such as *araras* (parrots) and wanted to preserve their sounds for posterity. "But you have them right here, why do you want to record them?" I asked. His answer was vague. He wanted to share the recordings with "people." "There were sooooo many when we first moved in," he elaborated, referring to the years during which the settlement was first established. "How beautiful!" he added. But at that time, when the

birds were more numerous, he did not care about them, not in the least. He was too busy taking down the forest, working hard, "suffering," he said. My other interlocutors at the *assentamento* told me similar stories of their initial relations with the local fauna. Those who were not disinterested in wildlife were aggressive towards it and many shot *araras* just for the sake of reducing their numbers and putting an end to their noisy, aerial social lives. This combative stance against the birds went on even though settlers saw *araras* as bearing remarkable, human-like qualities: parrots were extremely beautiful, smart, could be domesticated, and went about in couples which the *assentados* called "marriages" that were understood to last a lifetime. However, to their human predators, the *araras*'s "talk" was a permanent layer of sound that compounded and reinforced other attributes of a biophysical world that they sensed was deeply hostile to them. As the first clearings in the *assentamento* were completed, insects, wildlife, and native vegetation seemed to willfully oppose the settlers' struggles to build their sites. Mosquitoes brought dengue and malaria, monkeys and wild boar destroyed crops, jaguars and snakes posed life-threatening dangers, and smaller predators decimated domestic animal stocks and pets.

Peasants had to manage the challenges posed by the local environment while living on the verge of destitution. They had come to the area with very little money and their sites, forty miles from the village, rarely produced enough food during the first years. With no public transportation available at the time, my interlocutors had to walk to town and carry their provisions home on foot. The poorest among them, lacking cash to buy food, faced hunger and isolation—which pushed dozens of families to abandon their sites after investing so much in them.

Figure 20. Domesticated *arara* in an *assentado* house, 2010.

Despite the hardship of these initial years and his past struggles against native animals, Renato now spoke with sincere concern about how forests were being rapidly destroyed in order to give way to more and more pastures. He emphasized that as a result the birds were disappearing. Not at his site, though, he quickly pointed out. As his neighbors' sites burned and became grazing lands Renato's trees became a refuge of sorts for large quantities of birds. He had done much logging in his days, he told me, but he was now old and poor and lacked the strength and capital he would need to establish new pastures.

"How beautiful!" he exclaimed, going back to the birds. He would spend hours sitting under his favorite fruit tree in front of his wooden shack listening to their singing. "Life is good here," he repeated several times during our conversation. The forest was cool, humid, and comfortable—unlike the ever-growing pastures that, exposed to the sun, were too hot and dry and good only for cows. He was happy that his trees were standing even if they brought no income, although someone from Sao Paulo,

he recalled, once came and offered to pay him for his forest—pay him to leave his forest standing, that is. The project had something to do with carbon. He did not understand very well what it was all about but he liked the sound of it. "Do you know this person, from São Paulo?" I did not. But the potential buyer never came back and he forgot his name so things were left unchanged and now it was only he, his trees, his birds, his meager pension, and his drinking companions. He repeated that if he had a tape recorder he could show people the singing of the birds now living in it. "Show who?" I inquired. "People," was his only answer. He wanted to keep his forest, he insisted, but things were changing so fast, the birds were going away. The bus arrived.

After this conversation I visited Renato at his home several times over the next two years. We talked about his life, his family, his site. I learned about the many places in which he had lived across Amazonia and about his many professional incarnations as a gold miner, gunman, logger, land speculator, and more. I took my recorder with me every time I visited him, but in spite of his initial request he saw no use for it. For reasons that became clear only just before I left the *assentamento*, he never felt comfortable using my machine to record his parrots. We just sat and talked. Whereas our first conversation had revolved around wildlife and the pleasures of the forest, the last time I visited his main concern was an offer his wealthy neighbors had made to buy his site. Immediately before leaving Jaíli at the end of my fieldwork, I was working in fields near his property when I heard very loud sounds coming from his land. The ground shook. Massive trees crashed to the ground. The old man was selling the precious timber from his property to sawmills, I was told, probably cashing in before selling his land and moving away. Renato knew the pleasures of a quiet life and he

knew all too well the ephemeral qualities of wealth derived from timber exploitation. And yet he ultimately decided, as virtually all peasants in the *assentamento* do, to capitalize on his forest and move once again. It is possible that he completed his recording before moving and took the bird sounds with him as a memento of the site he lost, just as he had intended all along.

REDD+ and Animal Movements

Renato's comment about the visitor from São Paulo who offered him money to keep his forest standing illustrates the hopes that a carbon payments system elicited among *assentados*. Renato hoped carbon payments would complement his income thus enhancing his chances of keeping his site afloat. As I explained in the previous chapter, REDD+ was designed precisely to further flows of cash, goods, and rural commodities in order to meet the socioeconomic demands of peasants like Renato. As an adaptive policy, REDD+ was intended to stimulate a particular kind of movement, a form of de-stratification that while causing environmental disruption would be less aggressive than unbridled capitalism. Crucially, and unlike initiatives that took place in the region in the 1990s based on environmental education at public schools, REDD+ did not address humans as entities whose "environmental consciousness" could be cultivated to create a common ecological purpose. Rather, the idea was to work on the basis of multiple and decentralized individualistic decisions and help peasants attain their cost–benefit analyses in ways that would limit environmental damage—not to bring about a supra-individual operation, but to align individualistic decision-making with the program's goals.

The problem with this approach, however, was that even people like Renato, who did not want to accumulate cash endlessly but wanted only a quiet place in which to live, had to adapt their non-capitalistic projects to the overall framework of capitalist expansion without which REDD+ would not work. For not only did REDD+ require large industries wanting to present themselves as environmentally friendly, it was first and foremost designed to work with enterprises that, unlike Renato and João, capitalized on the transformation of the region into a ranching center. This partly substantiates discursive critiques of neoliberal environmentalism insofar as it shows how purportedly neutral approaches culturally situated. However, I claim that REDD+ may be seen less as a discursive imposition that affects particular subjectivities and instead can be seen to build on situated efforts to cultivate particularly aggressive modes of being human. In other words, Renato did not face a self-consistent, external project that imposed upon him capitalistic modes of being. He discussed carbon payments with me as no different from the maddening economic dynamics to which he ha contributed throughout his life; dynamics that became powerful in their own right and was forced him to fashion himself into a human being capable of enduring the hardship of de-stratification. In order to make this point more clear, in the next section I examine Renato's and João's stories in the light of Descola's ethnography of the Achuar.

Part Two

Renato's Parrots

My initial perception of João's place, that little clearing in which the corn seemed to hold its ground against the trees, was influenced by Philippe Descola's ethnography of the Achuar in Upper Amazonia, which I was then reading. "Standing free of the surrounding forest," Descola wrote about the Achuar household, "the inhabited area extends from the center on concentric circles" (Descola 1994: 110, Figure 21). At the core of the Achuar sites in which Descola lived, the house stood as a thoroughly humanized space around which large yards were carefully kept free of weeds. Surrounding the yard were gardens planted with domesticated species that were edged by banana trees. Beyond these lay the forest, a familiar forest closer to the house and an unfamiliar forest further away. Descola interpreted Achuar architecture—the gradient of spaces ranging from human dwellings to the unfamiliar forest—as a mode of inhabiting—and intervening in—the worlds they inhabited and that allowed humans to win "from the forest a small space of sociability" (Descola 1994: 126).
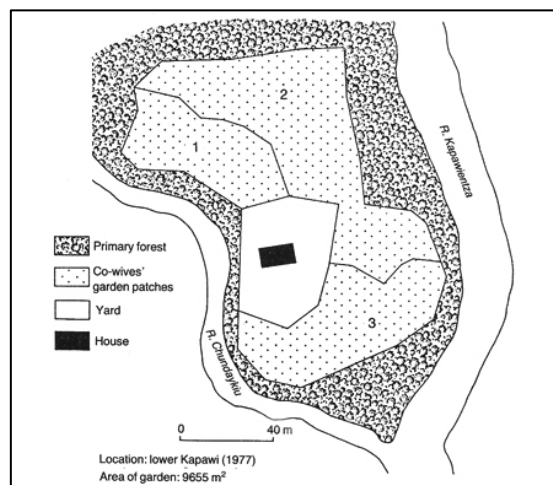
Figure 21. Achuar architecture. From: Philipe Descola, In the Society of Nature: A Native Ecology in Amazonia, 1994

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Figure 22. A site in the *assentamento* seen from space, image retrieved from Google Earth in 2013

I knew that beyond purely superficial resemblances there was nothing in

common between Achuar households and settlers' architecture (Figure 22), and yet

Descola's ethnography came to mind due to its particularly insightful analysis of how

humans in the forest made for themselves a place among non-human companions—

ranging from trees to animals to spirits. The conversations I had with *assentados*

regarding their contributions to recent Amazonian transformations were all concerned,

in one way or another, with the problem of how to build a place in which to live and

work that also serves as a site that could offer a measure of stability in the midst of

violently fluid situations. During the eight months I lived with *assentados* the issue of

streams of capital and technology was a daily topic of discussion: how do we capture

resources from environmental initiatives such as REDD+? How much debt was it

reasonable to acquire in the purchase of capital-intensive inputs such as fertilizers and

machinery? How much forest would they need to clear considering that this would

destroy some of the desired features of their sites and could bring penalties from

environmental authorities? These questions all concerned the material form *assentados*

wanted to give to their sites and how this form would connect with geopolitical streams

of capital and technology that were flooding the region—and that, crucially, they

wanted to attract. Such problems are similar to some of questions that Descola posed to

himself while living among the Achuar. In particular, Descola's work speaks to a

question that is central to the *assentados*: what does the architecture of the sites in

which they live tell us about the beings that build such sites and how they establish

relations between humans and non-humans?

João's claim that "man is the nastiest animal" characterizes the construction of his

site as the work of an animal whose particularly "nasty" capacities and dispositions

allowed it to forgo the world in which it lived. From this perspective, Renato's account

of his shifting relations with the birds in the *assentamento* clarifies João's claim. Now,

in order to interpret João's claim in the light provided by Renato's story, I need to first

examine in some detail the relations that Renato established with humans and non-

humans while building the *assentamento*. I do this by comparing the construction of the

peasant site with Descola's ethnographic account of the relations that Amerindian

communities established with non-human entities while building their homes.

There are two reasons this approach is productive. First, the *assentados* themselves

made such a comparison between the relations they established with non-humans and

those they had with indigenous peoples. When I asked my friends whether they agreed

with João's statement, the vast majority did not answer my question. As was the case

when I stumbled upon matters that were too sensitive to share with an outsider (such as

deadly disputes among settlers, the maneuvering of local elites in the *assentamento*, or

plans for future illegal clearings), my inquiry was met with silence and the changing of

the subject of conversation. Three people, however, did comment on João's assertion.

They were all particularly poor and from their position as relative outsiders they

enthusiastically embraced João's characterization of humans—with only one caveat.

They all told me that I should consider that not all humans were equally "nasty" and

that indigenous peoples had less destructive interactions with trees, animals, rivers and

so on.

Such statements, to be sure, conveyed ethnocentric ideas that relegate indigenous

peoples to "the savage slot" populated by "primitives" living in assumed harmony with

nature (Trouillot 2003). Nevertheless, I claim that the idea of non-capitalistic, non-

Western livelihoods that offers a contrast to accumulation-driven behavior is more than

a figment of our racist imagination and corresponds, at least partly, to material struggles

of indigenous peoples who have successfully cultivated modes of being human that

differ from those at play in the construction of capitalistic worlds. In other words, the

ethnographic memory of the Achuar at the time Descola completed his fieldwork

underlines the weirdness of seemingly "natural" inclinations at play in the construction

of the *assentamento*.

The second reason I argue that comparing frontier architecture and Achuar

architecture is productive is that the Amerindian ethnography with which I engage takes

an ontological approach and thus allows me to study the "nasty animal" *not* as an idea

or "worldview" but as a form of being human that emerges from a web of material

relations that link humans with non-human entities and processes. The Amazonian

anthropologists I follow do not understand humanity as a reality that lies "out there"

about which distinct cultures have distinctly different ideas (this was the case of Lévi-

Strauss, for example, for whom "human nature" was the objective capacity to build a

symbolic geological stratum that manifested itself in varied flower-like forms). Rather,

Amazonian ethnologists understand the human in terms of material relations that

persons and groups establish with other persons, groups and non-human entities and

processes. The human here is a shifting and contingent outcome derived from material

engagements and not limited to discourses or cultural ideas.

Of Parrots and Humans

In order to examine the human in this way, consider anthropological debates over

indigenous claims about the relative status of humans and birds. As Terence Turner

once noted, one of anthropology's longstanding debates was about a statement offered

by members of the Bororo, which was glossed by Karl Von de Steinen as "we are

araras" (Turner 1991). For Turner, such a statement tested our cultural standards of

rationality by establishing a relation of identity between humans and animals.

Anthropologists have generally interpreted this claim as proof of the *opposite* of what

the Bororo were saying: when they said they were parrots, the argument went, the

Bororo were performing symbolic, emotional, or logical actions that were radically

different from what non-humans, *araras* among them, were understood to be capable of

doing. In other words, because they could say they were parrots, the Bororo were nothing like parrots: they inhabited a properly "cultural" or "social" domain that stood in opposition to a merely "natural" sphere. Lévi-Strauss summarized these ideas in *Totemism*—where he did not directly address the Bororo's claim but the similar Nuer statement that "twins are birds." Lévi-Strauss argued that the "primitive" idea that human and animal realms are on the same standing is intrinsically related to "the triple passage (which is really only one) from animality to humanity, from nature to culture, and from affectivity to intellectuality" (Lévi-Strauss 1969 [1962]: 101). Here I study the relative status of humans and non-humans through methods that are designed to address pre-given human capacities lurking in symbolic, affective, or logical operations that only the anthropologist is trained to unveil.

We find an alternative approach put forward by anthropologists who, rather than striving to translate indigenous ontological claims into more rational propositions, study them as puzzling but self-consistent "philosophies" or "ontologies" (Ingold 2000, Viveiros de Castro 2010, Descola 2013, Holbraad, Pedersen et al. 2014). From this perspective, the Bororo's identification with *araras* conveys the understanding that humans and *araras* share some essential attributes. According to Descola and Viveiros de Castro, this response to the Amerindian understanding that humans are not the only entities with whom it is possible to establish social relations (such as gift-giving or reciprocal exchange). The Bororo engage with animals as beings with which they share a social or human condition despite obvious differences in external appearance (Viveiros de Castro 1998). This Amerindian idea is conveyed with particular clarity in Amerindian mythology wherein:

The original common [mythical] condition of both humans and animals is not animality but rather humanity. The great mythical separation [that differentiates humans from non-humans] reveals not so much culture distinguishing itself from nature but rather nature distancing itself from culture. . . . Humans are those who continue as they have always been: animals are ex-humans, not humans ex-animals. In sum, "the common point of reference for all beings of nature is not humans as a species but rather humanity as a condition." (Viveiros de Castro 1998: 472, the internal quote is from Descola, 1994)

From this perspective, the social relations that humans establish with non-humans can be studied not only in myths but in the material architectural engagements that enable them. Descola argues as much when he describes the construction of the Achuar household. At the time he did his fieldwork the Achuar lived in isolated domestic units that gravitated around a large oval-shaped construction. Such buildings were raised in the midst of primary forests that were cleared to give way to a yard around the house and a series of gardens that provided basic subsistence crops (manioc, seer corn, banana, yams, and *colocasia*). Crucially, the labor that went into gardening entailed cultivating a relationship with Nunkui, the tutelary spirit of the gardens that, inhabiting the topsoil, was the mother of all cultivars—domestic plants are her offspring. This means not only that gardens are inhabited by a spirit that bears some human qualities, but also that the plants, insofar as they are descendants of such a spirit, also bear some human capacities, including having "souls" of their own (Descola 1994: 196–197). Gardening in this animated world entails proficiency in the forms of singing by which human communicate with Nunkui and her offspring and convince, seduce, or charm them into desired behavior such as to thrive and provide abundant foodstuffs (idem 200–206).

Passing beyond the gardens and the familiar forest which stands in the immediate

vicinity of the typical Achuar house, Descola visited hunting grounds that extended 40–50 square kilometers (25–30 miles) around the site. This is where men usually confine their hunting expeditions (for hunting is a male activity). Although this area was characteristically non-human, it was not "wild" insofar as game was always already immersed in social relations prior to their encounters with men. The animals the Achuar hunted were "domestic" creatures belonging to forest spirits (kuntiniu nukuri or "game mothers") who behaved as their guardians, protecting them, enabling them to thrive and also feeding from them (much like humans were related to their domestic animals). A successful hunter therefore not only had to master skills with the bow and the shotgun but also to behave properly so as not to earn the wrath of game mothers. In particular, the Achuar had to hunt in moderation and show respect for the animals they killed. Like gardening, hunting also entailed the singing of magical songs whereby men communicated with game, introduced themselves as their brothers-in-law and charmed them into coming within shooting distance (idem 260–263).

Among the Achuar, gardens and hunting grounds were platforms which humans helped build as they placed themselves within sets of social relations woven together with non-human entities. Rather than a random, desegregated collection of particles and entities, the Achuar world was a meshwork carefully composed by animals and plants that were not limited to those involved in gardening and hunting and encompassed insects, birds, plants and trees who enter into symbiotic relations (such as the birds who secure permission from the trees in which they build their nests or insects who live off a "mother-animal"). This, however, does *not* mean that the Achuar stood as "good savages" in perfect harmony with an over-determining Nature in which everything and

everyone had its place (a proto-fascistic understanding visible in deep-ecology fantasies such as James Cameron's *Avatar* movie from 2012). Human/non-human relations comprised predation and warfare. The manioc, for example, was a vampire-like creature that could draw blood from humans (particularly infants) in order to grow. Similarly, game mothers could kill hunters by means of snake bites while jaguars and anacondas posed continuous deadly threats. Relations among humans were also fraught with complications and gender roles could lead not only to acute symbolic and social hierarchies but also to some forms of extreme physical violence.

The point Descola makes here is not that the Achuar signal a paradise lost but that they teach us that there is no primordial "animal nature" or "human nature" automatically driving human behavior and determining human/non-human relations. In the "society of nature," as Descola put it, humans are co-producers of worlds alongside animals and other entities that they recognize bear creative powers and productive skills. This animated cosmos cannot be disposed of according to human desires nor can it be accounted for by the standard metrics of capitalist trade. Inhabiting the worlds in which the Achuar live requires cultivating skills and dispositions that allow humans to remain alert to the actions and demands of non-human companions as well as to engage constantly in negotiations, collaborations, warfare, and so on. This teaching, moreover, comes not only from Descola but is also conveyed in a wealth of ethnographic material coming from Amazonia (Viveiros de Castro 1992a, Fausto and Heckenberger 2007, Viveiros de Castro 2010, Fausto 2012).

Human Animals in Movement

The analysis of João's claim using Renato's story and Descola's perspective should begin with recalling that both João and Renato were born in southern areas of Brazil and over the decades learned to transform forests into agricultural lands, cut open paths and roads through dense forests, carve new peasant plots out of public territories, fight off competitors from the lands they claimed for themselves, and negotiate with wealthy ranchers, land speculators, and dispossessed peasants. Although they were experts in transient modes of living, my interlocutors were unlike traditional riverside or indigenous populations in Amazonia who could derive their sustenance from the local ecology with only partial access to the cash economy. Without monetary income, settlers faced extreme deprivation, hunger, illness and probable death.

In places like Jaíli, settlers participated in the cash economy as wage laborers and by claiming land, replacing forests with pastures, and renting these pastures for grazing (and eventually, for those who were successful, by growing herds of their own). Unlike other areas in Brazil in which land appropriation by landless peasants was coordinated by social movements (Wolford 2010), in Jaíli settlers occupied the land in an un-organized fashion and in the midst of intense and often violent competition. I was often told that, during the years in which the settlement was built, the settlers had to be "brave" to take possession of the land—*ter coragem*—exposing themselves to violence and engaging in violence when they thought it was needed to assert their claims. Such a volatile situation in which families competed with one another facilitated Renato's and João's land speculation efforts and the elite's projects to capitalize on the needs of landless peasants. During "the run for the land" Renato saw parrots as irrelevant beings

or pesky reminders of economic and ecological hardships. There was no time and no space for establishing long-lasting relations with them—nor with his human neighbors. The main concern at that point in his life was with accelerating the movement of machinery and provisions into the *assentamento* to attract hundreds of landless families, complete transfers of land, extract wood that could be sold to the elites controlling the booming timber trade, and facilitate an inflow of seeds and cattle so that more money and more machines could be mobilized into the area in the near future. The *assentados* knew that those who had a better chance of succeeding were those who knew how to make the world fluid, breakable, flammable, transportable, and tradable.

We can grasp how capitalist operations shook the texture of the world by considering that, when Renato distanced himself from the more aggressive trends in ranching, the *araras* and their "talk" became an envelope of sound that reinforced the comforting idea that it was possible to build a dwelling place in the tropical forest. There was, to be sure, nothing idyllic in this latter, alternative mode of living. Renato had *not* become one harmonious whole with his environment: he still relied on frequent trips to town to gather provisions, see the doctor, and buy the industrially produced hard alcohol of which he was so fond. Moreover, Renato's meager income meant that he faced hardships that would eventually lead him to sell his land. My point, however, is that Renato sensed the world differently, cultivated distinct skills, and placed himself in an alternative standing in relation to global flows of commodities, cash, and agricultural inputs. He was glad to move away from competitive interactions that on various occasions could have cost him his life. He was also pleased to have slowed down, to have ample time and space for engaging in less aggressive relations with his human

neighbors, with the *araras*, and with the trees at his site. This is why—and I can only speculate here—he may have felt bad about using my recording as it signaled not only that he cared for the birds but that his actions were destroying the site in which they lived.

The perceived ontological status of entities that, however hesitant and remorseful, were capable of engaging in de-stratification dynamics can be best grasped by studying the word *bicho* that João used while arguing that humans are animals (*bichos*) of a singularly nasty type. *Bicho* is the generic word used to refer to animals in the *assentamento* (the word "animal," which also exists in Portuguese, is used less often and signals a sub-category of *bichos*). Although it encompasses a wide variety of living beings (insects, reptiles, mammals) *bicho* as a word offers ample room for taking into account vast differences among various types (Figure 23). In this sense, the term comes close to *animot,* a term coined by Jacques Derrida to refer to the "irreducible multiplicity of mortals" that "cannot be assembled within the single figure of an animality that is simply opposed to humanity" (Derrida 2008: 41, 47).

Depending on the intonation and the context, *bicho* may refer either to animals on which peasants depend for their subsistence or to forest animals with which peasants have to contend for space as they build their households in the *assentamento*. Forest animals, wild, unruly, and distant from the peasant house, are known only as *bichos* or *bichos do mato*. But there are also domesticated *bichos* that live closer to the house and bear an additional name: *criação*. This latter category encompasses animals that you feed, and that you ask your neighbor to feed for you if you go away on a trip (for they cannot live on their own and require constant human attention). Finally there is a

category of criação that has the additional name of *animais* and that includes only dogs, horses, and sometimes donkeys. *Animais* are beings that move close to the house but can also work in the forest and with which humans may co-operate in productive undertakings such as hunting or cattle herding (Figure 24).

Mosquitoes (*pium*), ants, spiders, scorpions, snakes
Large snakes, jaguars, rodents, wildpigs, deer, etc.
Chickens, ducks, turkeys etc.
Cows, goats, domesticated *pacas*, etc.
Horses, donkeys
Dogs

Bichos   *Animais*   *Criação*
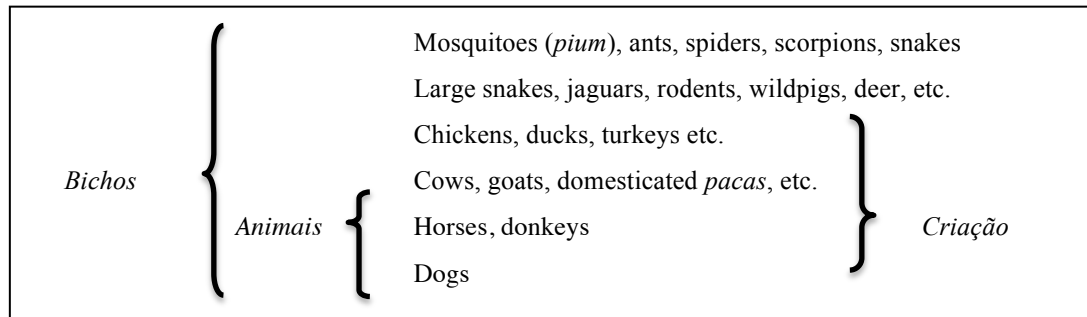
Figure 23. Types of *bichos* found in the *assentamento*.

Forest   Forest

Crops / Pastures   Crops / Pastures
            Yard   Yard
                House

Bichos do mato   *Criação*   Humans   *Criação*   *Bichos do Mato*
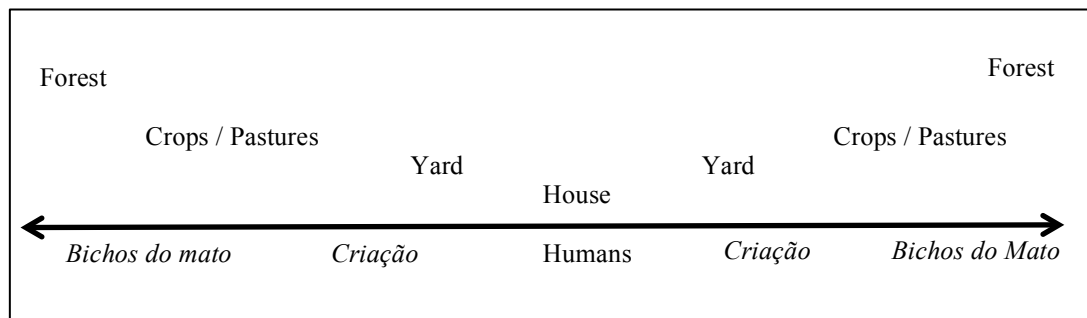
Figure 24. Ideal spatial distribution of *bichos* in relation to the peasant house.

Building a peasant site requires orchestrating complex relations among various kinds of *bichos*. For example, when a family detached itself from João's crew to build their site, they used fire to clear a plot in the middle of which they built a makeshift tent (Figure 25). Although the fire pushed some *bichos* away, during the first years *assentados* had to endure the pains of cohabiting with insects such the *pium*, tiny mosquitoes that swarmed during daytime in such numbers that they made it difficult to

eat and sometimes even to breathe. Meanwhile, monkeys, wild pigs and rodents destroyed their crops, birds did away with seeds before they could germinate, and predators often injured and sometimes killed their dogs. Snakes and jaguars were a permanent threat to the *assentados* themselves.

Figure 25. Peasant makeshift tent with a yard in which chickens roam keeping some bugs at bay. This picture was taken in an area occupied by landless peasants and the building techniques are representative of those used by *assentados* in Jaíli

Peasants were able to push *bichos* away and make a space of their own only thanks to the *criação*. Chickens, for example, eat spiders, scorpions, and small snakes around the house (Figure 25). At the same time, however, they attract large forest *bichos* which can easily decimate them. Therefore, in order to maintain the *criação* dogs are needed, for this is a rather unique *animal* that is capable of scaring off predators as large as jaguars. But the single most important *criação* in the construction of the peasant site are

cattle, the only substantial source of cash in the *assentamento* and the being on which the very economic survival of the household depends. A large and successful cattle herd allows peasants to buy chainsaws, hire tractors and workers, pay for gas and oil, and push back the forest and its *bichos*.

Figure 26. Pastures in Jaíli showing signs of soil degradation.

Cattle, however, undermine the very peasant operations they make possible. After a decade or so of grazing on the same pastures, cattle deplete the soil and decrease pasture productivity, which then reduces the size and health of the herd. To avoid this, landholders have to apply fertilizers and rent tractors to till the soil. But only landholders with large herds have the capital needed for such investments and peasants know very well—based on their own experience and on witnessing the bankruptcy of people around them—that those who keep only a few cows are the most likely to lose

their lands. This is why peasants are always trying to expand their sites and buy off their neighbors (an act to which they refer as "swallowing" their neighbors). Those who do not engage in such cannibalistic competition are likely to find themselves prey to larger parties and pushed into landless living once again.

In our conversations *assentados* were often proud and surprised by their own ability to withstand poverty, isolation, and the rigors of building the settlement. Against the odds they had improved living conditions in Jaíli in little more than a decade. At the same time, they were puzzled by how the results of their work had been, for the most part, captured by wealthy families, thus reinforcing highly unequal political and economic structures. The *assentados* with whom I lived also explained to me that, as cows increased their numbers and pastures replaced forests, the air was dryer and warmer, and the rains behaved differently. Droughts were more frequent and severe and posed particular challenges to the poorest peasants whose weak pastures had little capacity to withstand dry spells. The fear of landless living and migration had not vanished. The ranching economy they helped establish presupposed a state of constant competition and intensifying ecological impacts that, by definition, made it impossible for most peasants to keep their sites in the long run.

João's claim foregrounds what a puzzling kind of *bicho* humans can be. No other animal has the capacity to bring about such disruptions or to create *movement* of this type. A world that humans have placed in movement was a strange one that did not affirm people as capable of making for themselves a stable inside and instead made humans into animals roaming exteriors like no other. Humans are characterized by the capacity for "extrinsic living," for skills and dispositions that persons and collectives

use to endure the competition whereby they put one another in precarious situations and push those with fewer resources to migrate from places they would like to call home.

REDD+ schemes in the region were designed to work with these kinds of beings insofar as they offered poor peasants in Jaíli some resources to enable them to compete in this ranching economy. João, like Renato and virtually all other peasants I met, told me they would like to take part in the REDD+ project and receive aid he could use to continue opening his site. And yet, they all understood, much like REDD+ proponents themselves, that such aid would leave intact the region's overall economic framework and would dovetail with dynamics that drove the self-fashioning of humans as animals skilled in the art of exposing themselves to worlds they helped to bring into movement.

That the skills needed for the egotistic and self-interested ways of extrinsic living were hard to acquire and required constant rekindling show that Amazonian transformations do not result from a pre-given, inner human animal expressing itself in the world. Socio-environmental changes in Jaíli cannot be explained by referring to drives and impulses guiding personal behavior. It is self-fashioning *bichos*, rather, who are building new worlds in the areas of Amazonia in which I worked. *Nasty bichos* are more creative, hesitant, remorseful, and capable than the beings that some Westerners would call human animals. In the next section I show how the malleability that is characteristic of animal beings is shared by non-animals, namely, by the vegetation with which peasants engage as they build their homes. I will argue that, besides there not being an inner-human Nature, there is no outer Nature either (no raw, inert, pre-given matter determining human behavior through adaptive mechanisms). In order to make this case, I will focus on the practical questions and problems that the opening of the

peasant site entails.

Part Three

Building the Peasant Site

I heard trees falling at Renato's site while I was working at a site owned by two brothers. I will call the younger one Silvanei, a man in his early twenties who together with his wife hosted me for about three months over the course of two years. After I had spent a month living at this place, Silvanei and his brother received a visit from an uncle who, as a low-ranking politician, had close contacts with the elites behind the construction of the settlement. A decade before my arrival the uncle used his influence to help the brothers acquire lands in the area and secure loans from a large rancher so they could clear fields and plant pastures and crops. The uncle also invested his own money in Silvanei's site and his visit was arranged so the three men could discuss future ventures: Should they keep investing in expanding pastures? Should they instead focus on a struggling cash crop? Or should they join a new NGO project in the area that was offering monetary incentives for peasants to plant fruit trees and native forest species (and that, in the mid-term, could turn into a REDD+ project)? The discussions were extremely tense and just before the uncle's visit ended the three men, in an effort to avoid the women and the anthropologist, walked away from the house and carried on their animated discussion standing in the middle of farmlands. Meanwhile, I sat in the kitchen conversing with Silvanei's wife, whom I will call Lidia, about the various terms used in the settlement for native and foreign plants.

Like other settlers with whom I talked about these issues, she patiently explained to me a complex and dynamic typology wherein there was no single name for "forest" and instead vegetation was named according to the space in which it grew and the

directionality of its growth. Closer to the house grew smaller, domesticated species that composed the *huerta* (garden). Further away was the *lavoura* (farmlands) and the *pastagem* or *capim* (pastures). Finally, far away from the house, she said, was the *mato*: native forests that, in this area, had been exploited by loggers who extracted the most valuable timber. None of these three terms referred to static entities but alluded to dynamic, ever-shifting forces. The *mato* was a centripetal force that pushed from the margins of *lavouras* and *capim* towards the house, always threatening to "close" sites that were not properly maintained. In contrast, farmlands and pastures were not only important as sites in which particular goods were produced, but also as centrifugal forces that could help push native vegetation and animal species away from the house and expand the peasant site (Figure 27).

Juqueira / Capoeira	Roça		Roça	*Juqueira / Capoeira*	
Mato	**Pastagem / Lavoura**	**House**	**Pastagem / Lavoura**		**Mato**
Outside		Inside		Outside	
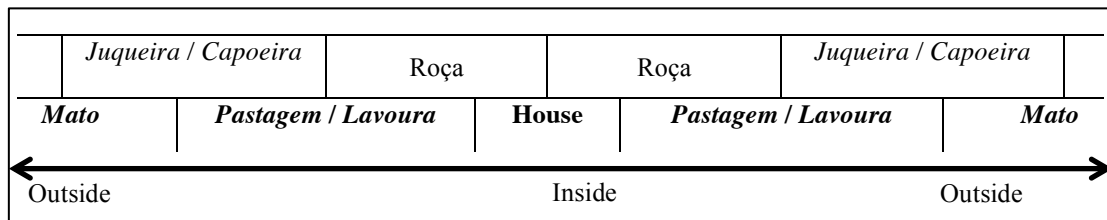
Figure 27. Ideal spatial distribution of vegetation types in relation to the peasant house.

The dynamism characteristic of the vegetation explains the need for names that designate transition spaces in which centripetal and centrifugal forces mixed. *Juqueira* and *capoeira* designated spaces in which native plants and tree species irrupted within pastures and farmlands due to lack of care—they were the vanguard of the *mato* advancing over the house. A similar term was *roça*, which designated an intermediate space of human activity in which work was being deployed in order to fell trees or

maintain domesticated spaces—the *roça* signaled the advance of the house space against the forest.

This typology echoed Descola's depiction of Achuar architecture. As I have mentioned, from Descola's perspective the Achuar site was a gradient of spaces linking the human and the non-human: an anthropogenic sphere surrounded by ever-distant concentric circles composed by the garden, the plantain trees, the familiar forest, and finally, the unfamiliar and more dangerous forest beyond. Similarly, Lidia and my other interlocutors in the *assentamento* depicted their sites as constituting an interior, anthropogenic sphere standing at the center of a continuum of spaces built over an equilibrium of forces. The ideal image of the peasant site was that of a passage from gardens to farmlands, pastures and the forest, balanced between centripetal native vegetation and centrifugal domesticated plant species.

Nevertheless, and despite these very broad analogies between Achuar and settler classifications, the everyday uses of the word *mato*, the practical engagements in the site, and the technological deployments advanced by my interlocutors contradicted the ideal descriptions of their sites. Whereas they talked about a steady passage from a human inner space to a non-human exteriority, they faced a much more complex situation. To wit, their architectural undertakings were intrinsically unstable as the centrifugal forces of *capim* and *lavouras* they struggled to push outward could easily turn around against them, becoming *mato* and overrunning their sites. *Assentados* could never be sure their efforts were not feeding forces that could eventually force them to move away and sell their lands. In order to explain this situation, I first explain in greater detail the practical work that went into building the *lavouras* and the *capim* that,

ideally, could keep the *mato* from "closing" the peasant site.

Figure 28. Seeding *capim* to push back the *mato*.

Building a Peasant Site

Two months before I moved in with Silvanei and Lidia, he and his brother borrowed

money and bought oil and fuel for their chainsaws, hired some neighbors, burned about

80 acres of their forest, and seeded the area with pastures. They explained that these

actions were part of a process of "forming" (establishing) pastures, but also of

"forming" (building) their site. This is to say, without pastures there could be no peasant

site. The seeds they used were *brizantão*, which resulted from engineering African grass

varieties into organisms that withstood Amazonia's extended dry periods and acidic

soils. Despite working hard clearing native vegetation and burning a large area in order

to offer a space in which the seeds could thrive, the *brizantão* failed to set root and

native vegetation quickly re-grew, benefiting from fire which broke the dormancy of native seeds in the ground. Seeing the forest "closing" an area opened through grueling and costly efforts, Silvanei and his brother returned to the field and invested more time and money in reseeding *brizantão*. I was recruited for the operation and this was my first contribution to the forming of a settler's site (Figure 28).

Figure 29. *Capim* that grew beyond control and became *mato*.

The difficulties my hosts were having in forming new *capim* was the structural opposite of the problems they faced in another area in which they were trying to replace *brizantão* with cash crops. At this second site, after clearing native vegetation and establishing pastures, they changed their minds and decided it would be more profitable to turn *capim* into crops. They applied a powerful and costly herbicide to get rid of the grass but the *brizantão* kept growing back from remaining root systems, growing tall and strong, asphyxiating (*abafando*) the young crop and generating severe economic

losses (Figure 29). I asked Silvanei's brother why the *brizantão* was strong in one place and weak in another. "Nature," he asserted, "nature tries to stop what we do. We plant pastures and the insects come. Animals too, other plants, rats, they come; it is always like that. Then we plant cash crops and the pastures asphyxiate it."

This conversation with Silvanei's brother was among a handful of occasions on which someone in the *assentamento* used the word "nature" to describe activities pertaining to opening a peasant site. The few times the term was used it meant something radically dissimilar from the Western concept of Nature. One day, for example, Silvanei joked about how I, poor devil, was always working on the fields away from the river, where all visitors wanted to go. City people, he argued in laughter, were always so keen to see "all that nature." At other point I was walking across pastures alongside a rancher when he exclaimed "well, is it not nature . . .?" while pointing out a seed that, after strong rains, hatched in the open air and sprouted roots that would clearly fail to reach ground. On yet another occasion a teenager and I sat on the porch of a house and we discovered that what we thought was a leaf was actually a butterfly. "Only nature could do such things," the young man said.

These uses contrast with those that Timothy Morton attributes to Western intellectual traditions wherein, he argues, "'nature occupies at least three places in symbolic language": first, it is an empty holder for a host of other concepts; second, it is a norm against which deviation is measured; and third, it is a word that "encapsulates a potentially infinite series of disparate fantasy" (Morton 2007: 14). Whenever I encountered the term in the *assentamento* it did not mean normality or fantasy, denoting instead foreign and erroneous perceptions of the region or to puzzling or infelicitous

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relations among heterogeneous entities. More importantly, "Nature" in the Western sense was used in brief comments or observations and was absent from more extended dialogue about peasant life, the history of the *assentamento*, or the future of the region.

Whereas "Nature" was mostly absent from everyday conversations, *mato* was constantly used in order to make sense of the varied relations between humans and non-humans. For example, two days after talking to his brother about how Nature seemed to resist peasant efforts to form a site, Silvanei and I had time for a long conversation while working the fields. We had just finished re-seeding the area and while his brother was busy with some other task we assessed the seeding done, uprooted some weeds, and "hung out." I told Silvanei about my conversation with his brother and asked him if he agreed with him regarding the hardships that "nature" imposed on settlers as they tried to form the *sitio*. After giving it some thought he responded:

> Well, yes, it is because of nature. Here [in the field in which we stood] you have the hand of man. And you have nature trying to close that. If you give up [on your pastures] it will be closed by the *mato* [forest]. For example, when we opened this area and we planted *capim* we used a lot of seeds but only a few grew. . . . If we give up now the *mato* [in this case meaning the forest] will return, it will grow again."

I then asked him about the area in which the new cash crop was struggling with the *capim*.

> There it is. Nature again! It is the same thing. There we are dealing with nature because we are trying to destroy something that was already formed. We are destroying what was there and we are doing something else, and nature opposes that. But if we continue we will be able to go through that first stage, we will overcome that cycle of nature . . . once the [cash] crop is strong it will be able to keep the *mato* [in this case meaning the pastures] at bay.

As in his brother's account, here "nature" was used to describe the general

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difficulties of opening a site. More precisely, "nature" was used to explain a singular

inertia that made it difficult for peasants to break apart the relations that a group of

entities (soils and plans) had established. The term "nature," however, was highly

confusing as it could refer to "artificial" assemblages of chainsaws, fertilizers and

engineered pastures, or to native vegetation. In fact, my friends used the term only

during my first few weeks at their site as they were trying their best, I believe, to render

their worlds intelligible to me. And even in these early conversations the term *mato*,

rather than "nature," was central. In Silvanei's account *mato* was the category that stood

for the particular forces with which *assentados* had to struggle. *Mato* was the name he

gave to forests growing over the pastures he was struggling to form. And *mato*,

crucially, was also the word he used to describe the grasses that threatened to collapse

the cash crops. *Mato*, therefore, was a strange concept that referred to both engineered

seeds and native forests, rendering inoperable the categories of artifice and Nature. The

longer I lived in the *assentamento* the less often my friends used the word "nature" with

me, and the more *mato* appeared in formal conversations. My familiarity with this

complex and contradictory term grew in parallel with my understanding of the

architectonic contradictions of the peasant site.

Building on *Mato*

Let me return to the conversation I had with Lidia while the men discussed future

investments in their site. After Lidia finished describing the ideal form of the peasant

site (wherein *mato* is described as tall, native forests growing away from the house), I

told her about the various meanings of the word *mato* I had encountered while forming

pastures with Silvanei. It seems, I argued, that her definition of *mato* as large, native vegetation growing away from the house was at odds with everyday uses of the term. The day before, I reminded her, she used the word *mato* to describe the little weeds that I should uproot to clean up her garden. Clearly, little weeds were not massive *castanheira* towering 30 meters and more up to the sky. She laughed out loud, agreeing with me and expressing sympathy for my efforts to understand "the crazy people" (*o povo doido*) of the settlement. Yes, she thought out loud, *mato* does not have to be very large and does not have to stand away from the house. In can be very little, it can grow next to the house; it all depends on how you look at it and what you are trying to do with it.

After we both went around this for a while I arrived at a conclusion that pleased us both (which is not to say that Lidia fully agreed with me, but that she—and the other *assentados* with whom I shared this interpretation—did not think my conclusions where particularly "crazy"). Maybe *mato*, I said, could be thought of as forces that can de-form or close the site that they, my peasant friends, were struggling to build, to open. From this perspective, *mato* could be seen to emerge both from non-human dynamics such as the growth of tropical forest species as well as from human activities such as cattle-breeding—which, as I have shown, leads to soil depletion and the growth of *mato*, and may cause the collapse of pastures and the bankruptcy of the site.

This interpretation of *mato* makes it possible to examine the settler's site as an architecture that did not result in a human "interior" expanding against nature's "outside" pressures. Rather, the problem peasants faced in Jaíli was that the very strategies and tools they used in the building of a comfortable, economically viable

inside often led to the emergence of *mato* that could potentially collapse a site and expose settlers to landless living.

Our conversation in the kitchen shed light on the discussion that was taking place among the men standing amid the cash crop. Silvanei, the younger brother, was alone on one side of the argument. He wanted to join the NGO program in order to receive the benefits they offered to plant fruit trees and native species at his site: some hours of tractor use, tree stalks, and seeds. Silvanei intended to use the seeds in his cash crop to grow species capable of fixing nutrients and working as "organic fertilizer"—thus saving operational costs. Eventually, he would sell fruits and use the money together with the income derived from his cash crop to repay his debts. At that point he would buy machinery and fertilizers to take down more forest to expand his grasslands and breed a large herd.

On the other side of the argument were Silvanei's older brother and his uncle. They advocated for a more conventional site-forming strategy. They would borrow even more money to clear more forest and expand the pastures, rent the area to large landholders for grazing, and gradually establish their own herd. In parallel, they would consolidate the cash crop while investing in new grass varieties and fertilizers to keep their pastures strong. With time they would take down the remaining forest and buy other sites from *assentados* around them—thus establishing a large ranch.

Although the differences between the brothers were deep enough to create a strained atmosphere, there were significant overlaps between their conflicting architectural projects. Neither side was advocating for protecting, transforming, improving, exploiting, or domesticating "Nature" or "forests." For both of them, building a peasant

site was an open-ended task of bringing about and constantly maintaining a form capable of resisting the pressure of the *mato*—which is to say, of the forest around it and of the several internal contradictions of this ranching economy. The older brother and the uncle envisioned (as most other *assentados* did) a ranching architecture connected to credit institutions, patronage relations, and meatpacking factories. Such networks would provide access to cash, labor, chainsaws, and bulldozers that would be used to form more and more pastures. In the younger brother's eyes the site could be connected with NGOs that could provide help in enriching soils without incurring debt as well as in developing additional income sources he could use to build a stable economic base from which he could invest in new pastures—very much like his brother was hoping to do from the outset. If, as pretty much everyone hoped would happen one day, a REDD+ project was finally established, the stream of cash derived from carbon payments could complement ranching undertakings and support additional technology investments in the site.

Both brothers also understood that the difference between forming an inside of well-being and being thrown into the outside of landless migrations was razor sharp. There was no way of knowing which forming strategy would lead to which outcome. Neither could defend his plans by pointing to a strategy that had proved to be a successful formula. What had worked in Jaíli a decade before was no longer working; the ground was shaking. There was no model they could hope to follow, no "natural laws" and no certainty beyond the fact that *they had to strive to form something* and avoid being "swallowed" by their neighbors or wealthy ranchers. Invest, mobilize tools, grow plants, breed animals, deploy chemicals, establish alliances with powerful persons and

institutions, assert themselves and their economic operations, thrive over others—there were many options but none with a sure outcome. Such uncertainty fueled discussions over the course of which Silvanei observed that debt and reliance on local elites could effectively force them to hand their site over to rich landholders in order to cover their debts. His brother replied by arguing that relying on NGOs could mean that in the future they would be forbidden to open new areas—which would condemn them to having only a small pasture and living in poverty.

Mato and Extrinsic Living

The brothers' argument allows us to understand the complexity of building a peasant site in the midst of de-sedimentation processes. Their disagreements about planting trees or pastures were concerned with architectural efforts that were never-ending and not limited to discrete, rationalistic, cost–benefit evaluations. The house, farmlands and pastures did not stand over an immutable and passive Nature but brought humans into relations with *mato*, an always-unpredictable quasi-animated force capable of popping up in unexpected places and of returning from where it was thought to have vanished. The continuous appearance of the term *mato* in Amazonian ethnography further clarifies the significance of the term and what it contributes to an entropolitical understanding of contemporary climate politics.

For decades, the term *mato* has interested geographers and anthropologists working in Brazil. In a 1948 Leo Waibel argued in a study on the viability of new settlements in central Brazil that "the spellings *mato*, *mata*, *matto*, and *matta* are used for forest land" (Waibel 1948). Lévi-Strauss offered an alternative interpretation in

1955, arguing that it was wrong to translate *mato* as "big forest." The feminine word *mata*, he claimed, was the only equivalent to "forest." *Mato* was "big bush." *Sertão* on the other hand was "bush" but also signaled the more generic opposition between inhabited land on the one hand and "a region . . . where man has not yet contrived to set up his home" on the other (Lévi-Strauss 1955 [1974]: 142).

Ellen Woortman elaborated on Lévi-Strauss's ideas in her study of peasant sites in the state of Sergipe, a region she described as a *sertão* in a non-tropical forest region in eastern Brazil (Woortmann 1983). Woortman's claim was that it was possible to interpret *mato* as a culturally specific way of alluding to the opposition between "nature" and "culture" (*idem*: 180). The word *mato* in her interpretation stands for public lands with abundant trees and native species where peasants gather timber and medicinal plants that have not been "domesticated by human labour" (*idem*: 177).

Ethnographic evidence gathered around the same time in Amazonia partly supports Woortman's structuralist interpretation—but ultimately contradicts her conclusions. In 1979 Octavio Ianni published a conversation with a gold miner who described his work in Amazonia as requiring him to spend up to three months in the *mata* (tropical forest). The miner added: "the city is worse than the *mata* for the poor, because there [in the *mata*] we have crops, we breed pigs, chickens . . . here [in the city] all the money that we are able to make is not worth a thing" (Ianni 1979). Although for the gold miner *mata* stands for "forest" and in opposition to the city, *mata* also refers to a space in which the poor may domesticate plants and animals, a space more hospitable than urban regions and therefore not a "savage" space. All of these interpretations see *mata* and *mato* as culturally specific terms that refer to the same

reality: Nature. This naturalistic approach elegantly sidesteps the perspectivisim intrinsic to the term *mato* and which the concept of Nature is unable to explain. In other words, *mato* emerges in relational situations wherein an entity is engaging with a reality that is neither a pre-social, objective thing "out there," nor an inner "human idea."

Things become clearer in Candance Slater's *Entangled Edens*, in which she tells us how, while conducting research with *riberinhos* (riverside populations) who live at the shores of the Amazon river, her interlocutors used the terms *mata* and *floresta* (forest) strategically, aware that others are engaged with the worlds in which they live in ways that carry political implications. As one of her interlocutors explained, "the rain forest is something about which outsiders care. If I say *mata* you might not listen" (Slater 2002) 178. Slater goes on to explain that, as I experienced it in the *assentamento*, *floresta* or "forest" is a word that is scarcely used in everyday conversations in the Amazon as it expresses environmentalist and expert commitments, attachments, and forms of knowledge. *Mata*, on the other hand, is used more often and it denotes familiar spaces inhabited by spirits and enchanted beings, places and times in which humans may talk and establish social relations with non-human entities including birds (*idem*: 167). Slater reveals a tension in the uses of the words *floresta* and *mata*. *Floresta* alludes to Amazonia as Nature, an inert biophysical word opposed to humanity and culture. *Mata*, on the other hand, refers to landscapes that carry with them cultural meanings, stories and beliefs. *Riberinhos* are quite aware of these differences and what they entail and some are ambivalent about using the term *mata* in front of strangers, particularly as they are in the middle of legal struggles for their lands. They think that the belief in enchanted beings and non-Western beliefs entailed by the category *mata*

could make them look irrational to outsiders and undermine their legal struggles.

The point of revising the multivalence of these term is not to arrive at a single, truthful definition of *mato* (at any rate, the ethnographic material here cited is too diverse and belongs to radically unlike peoples and regions). This overview, however, shows us that this word illuminates multiple modes of engaging with the world and determining capacities and potentialities that apply to human and non-human entities and processes. When Waibel translated *mata* as "forest land," he did so while consulting for the Brazilian state and studying a large region in central Brazil in which Brasília was eventually built. His study recommended settlement projects that in his view could alter large parts of the region's ecology in order to establish agricultural fields. The geographer was therefore part of a group of experts that established an inflow of technologies, persons, and agricultural inputs to central Brazil whereby lands were treated as reservoirs of resources whose composition was shaped by agrochemicals, machinery, and new, sprawling cities.

On the other hand, when the *riberinhos* with whom Slater worked used the category *mata* they did so to establish the presence of social relations with humans and non-humans. The *riberinhos* were engaged in dense transactions that included gifts, reciprocal exchange, and predatory relations, all of which brought humans, animals, spirits, and enchanted beings together. The relations that took place in this *mata* created spaces that differed profoundly from those in areas of capitalist expansion. The difference between Waibel and the *riberinhos* is not that of two culturally specific ways of representing the same thing, "forests" or "Nature." *Mata* is not a word that conveys subjective views of the same objective reality. The point is that *mata* denotes diverging

relations between humans and non-humans whereby singular worlds were brought into being.

It is hard to overstate the extent to which *assentados*'s understanding of *mato* diverge from *riberinhos' mata* and Waibel's *mato*, *mata*, *matto*, and *matta*. Unlike the worlds inhabited by riverside communities, Jaíli's lands were barren of spirits or ghostly entities. As a close friend of mine put it, "I don't believe in ghosts. With all the deaths I have witnessed I have yet to see one." He recalled close friends of his dying in mining and logging accidents, others over land disputes or political rivalries, some others over a small quantity of gold and for no apparent reason in the midst of a drunken fight. None of these deaths were followed by the return of an entity demanding justice or the reestablishment of a disrupted order. Similarly, spirits were absent from the forests I visited. Even if *bichos* were social and intelligent creatures (much more than mere calorie-driven machines) they were not in the position of spirits who are powerful enough to demand acts of reciprocity from those live of native vegetation and fauna. Suffering, which I was told was widespread among humans while they formed their sites, did not come from disrupting social relations or breaching a moral order but from acts of bare force—running up against misfortune or encountering an entity bearing deadly force (such as a snake) or having access to more tools (machines, capital, guns) to open the forest. Dynamic and animated, the *mato* did not entail a well-ordered cosmos and made no concessions to accommodate human modes of living.

The *mato* was also rather different from Waibel's non-cultural "forest." The *assentados* were closer to having an entropological understanding of human/non-human relations than to thinking within a naturalistic framework. They struggled to build their

sites in worlds in movement wherein soils were expected to degrade, crops and pastures were known to fail, and native vegetation could always return. Such precarious worlds, however, were always already shaped by human actions. Peasant actions influenced the deployment of machinery and inputs that in turn modified biodiversity patterns and the climate and further disrupted ecological dynamics. *Mato* was in this sense analogous to the figure of the Anthropocene insofar as it designated the practical, non-propositional understanding that the textures of worlds humans inhabit are thoroughly colored by human activities. The humanized worlds of the *mato* and the Anthropocene were not particularly receptive to human modes of living but to the contrary challenged people to learn the craft of extrinsic living. This is to say, humans were challenged to cope with inhabiting worlds whose creative instability and movement was expected to continue, even to intensify, in the face of human and non-human death. Such were humanized worlds that could dispose of and had no need for humans, a radical exterior wherein de-sedimentation continues in the absence of humanity.

Conclusions

Homo Economicus

REDD+ is often presented as a strategy to influence the behavior of *homo economicus*, which is to say, self-interested individuals who respond only to incentives that alter cost-minimizing, revenue-maximizing calculations. REDD+ proponents thus seem to argue that humans are egotistical animals whose rational mind allows them to thrive only in movement. Such a claim would be correct only to the extent that it echoes peasant claims that, in places like Jaíli, *it is difficult not to act egotistically, like a* homo economicus. Dispossessed populations do seek what I call de-sedimentation and they call *movement*. And living in such worlds in capitalistic flux requires behaving in singularly selfish ways. At the same time, however, *assentados* are aware that the tremors that melt familiar worlds away benefit only a handful of rogue entrepreneurs and impose great suffering to most people. Peasants know that movement comes with great hardships and that, for this reasons, *it is also extremely hard to behave like a* homo economicus *in Jaíli*—it is no easy task coping with the sense that one's own actions undermine the very grounds on which one would hope to find a place to live. Therefore, in the *assentamento*, it is possible to understand that remaining at the margins of the ranching economy is as difficult as taking part in it and no choice comes naturally, without constant effort and artifice.

In broader terms, in Jaíli it is possible to see how wrong are theories that claim humans are *homo economicus*. An expanding ranching economy does not signal the dominance of a calculating mind but rather the situated skills of humans capable of living in unfamiliar forests, enduring food deprivation, being exposed to accidents and

the violence of other humans, and becoming a more-than-human disruptive force. Humans are *bichos ruim* then, and not *homo economicus*. Nevertheless, the *bichos ruim* that may be found in Amazonia are not part of any Nature but are produced by arduous self-fashioning processes. João and my other interlocutors teach us that settlers in Jaíli did not live according to the impulses of an interior human Nature that felicitously finds expression in capitalistic competition. Nor are peasant actions the result of the pressure of exterior economic forces that, like a second Nature, would hold them in an inescapable trap. In these terms, if carbon payments seem like a good idea for peasants like Renato is not because they fit within their egotistical calculations, but because they offer tools they can use to navigate profoundly contradictory situations. The support for this policy among the *assentados* with whom I discussed REDD+ should not be read as an unconditional embrace. As João put it with particular clarity, peasants are weary that such environmental policy approach ultimately fails to deliver anything but confirmation of the sense that disposed peasants should await no hospitality and keep training themselves in the arts of extrinsic living.

Although pro-REDD+ literature seems to be premised on the characterization of humans as *homo economicus*, pro-REDD+ scientists do not justify their policies on the basis of "inner" or "outer" Nature. They do not see carbon payments as necessary on the grounds that they express the unavoidable calculative ways of the human mind. If scientists are able to overlook and minimize the extent to which they promote the breeding of egotistic humans it is because they are themselves busy learning to live in unsightly worlds. Their policy proposals, without recourse to the idea of Nature, promises nothing but a better chance in violent capitalistic competition and conveys an

aesthetic perception of the world as a cold place indifferent to any human sense of order or composition. With scientists whose environmental research has informed REDD+ proposals we may study what one might call "wilderness without Nature": a material situation created by humans as they creatively take part in the frenetic, endless movement of cannibalistically expanding capitalist operations.

CHAPTER THREE
EXPERIMENTATION IN THE OPEN

> Some of our wise men turned to the
> contemplation of deserts. A stone in the sand
> in the setting sun could be very beautiful,
> they said.
>
> Margaret Atwood, *Time Capsule Found on a Dead Planet*

Introduction

In October 1991, Bruno Latour joined a group of scientists who worked at an open-air laboratory in a forest/savanna transition area in Amazonia (Latour 1993[1991]). His trip took place between two key events in the history of the region: the murder, in 1988, of environmental leader Chico Mendez and the 1992 "Earth Summit" that took place in Rio de Janeiro (a United Nations conference on "Sustainable Development"). These occurrences, each in its own way, brought the region to the forefront of global political discussions in which Northern policymakers and commentators often framed the situation as "Nature under threat." "Sad" narratives of Amazonian tropics foregrounded violence against social movements, widespread deforestation, increasing inequality, and dwindling biodiversity. Similarly worrying, however, were policy proposals designed by experts who claimed that their familiarity with Nature's laws allowed them to offer indispensable advice on how to "save the forest" (which meant restricting economic development in the area, limiting human impacts, and preserving the biome to the benefit of the global ecology). As Amazonian-based scholars pointed out, such proposals assumed that the prize to pay for saving Nature was the exclusion of local populations from political forums and the

characterization of non-humans as objects destined to be commanded by Western technocrats (Hecht and Cockburn 1989, Viveiros de Castro 1992b).

Against such an accretion of despair, Latour took an optimistic stance and suggested that the open-air laboratory he visited was a construction undertaking that could inform more democratic political strategies capable of healing the wounds opened by ongoing socio-ecological crises. His ethnography depicted open-air experimentation as an exploratory endeavor through which scientists materially transformed parts of Amazonia while learning to "feel," "see," and "hear" in novel ways (Figure 30). Thanks to the experimental cultivation of aesthetic sensibilities experts could engage with socio-environmental problems not as technical failings in need of fixing but as wounds that ripped apart human bonds with the world and that needed sustained attention and care.

Figure 30. Latour's scientists in the forest/savanna transition area. From: *The "Pedofile" of Boa Vista: A Photo-Philosophical Montage*. 1995[1993]

According to Latour, in the open-air laboratory he visited scientists were able to see how a non-human entity (a worm) that was previously "unseen" by experts was helping to expand forest cover. Offering a hopeful image of non-humans helping to transform Amazonia in ways that resulted in more forests, Latour suggested that scientists offered a good example of a new approach to environmental politics. Rather than trying to "save the forest" by preserving it "as it is" or "should be," experts could build experimental spaces in which occluded entities could be brought to the senses and engaged with as partners in open-ended ecological transformations that would make the world more hospitable. Latour suggested that climate politics as open-air experimentation would be an aesthetic undertaking that would help ensure "the coherence and continuity" of an "interior world" that would be ample enough to include non-experts and non-humans as co-participants in the re-composition of new, more generous worlds (Latour 1993[1991]: 170).

In the more than two decades that have passed since Latour's fieldwork, environmental scientists have used the results of groundbreaking open-air experiments in Amazonia to reject the idea of the region as Nature that experts may protect or improve based on pre-determined plans (Hochstetler and Keck, 2007; Schwartzman, 2010). REDD+ schemes are by far the most significant policy outcome derived from open-air experimentation in the basin and while its supporters call it "the biggest experiment in tropical conservation history" (Tollerson 2009), its critics argue that it is "the world's largest experiment" in payments for environmental services (Corbera 2012). In this chapter, I revisit Latour's ethnographic study of open-air experiments in Amazonia to show how field experiments in Amazonia inform the design and

implementation of REDD+ schemes in the region. Latour's ethnography is particularly useful for the study of REDD+ as it clarifies how REDD+'s experimental approach differs from environmental projects in which non-humans and non-experts have been taken as objects of control. While in chapter one I claim that REDD+ proponents engage with an animated human geology, in chapter two I argue that REDD+ was designed to take into consideration socio-economic claims of non-expert populations some of whom (landed elites) are invited to play a central role in climate politics. I now claim that these two key characteristics of emerging climate politics in Amazonia (its openness to non-humans and to non-experts) are easier to grasp once we consider how its experimental aesthetics diverge from modernist techno-managerial aesthetics.

As critical studies have demonstrated, aesthetics is central in the design and implementation of techno-managerial politics. As Susan Buck-Morss put it, aesthetics may be seen as "a form of cognition, achieved through taste, touch, hearing, seeing, smell—the whole corporeal sensorium" (Buck-Morss 1992: 6). Unlike propositionally based forms of knowledge which rely on logical chains of reasoning, aesthetics does not allow persons and groups to determine whether, for example, the assumptions on which a forestry plan is based are "true" or "false," "good" or "bad." An aesthetic approach makes it possible for groups to assess whether a forestry plan is "appropriate" or not, if its constitutive parts "make sense" and come together in a wholesome, "beautiful" composition, or if, to the contrary, they create "ugly" dissonance. Although aesthetic considerations may seem secondary to rationalistic arguments, James Scott has forcefully demonstrated that several development and ecological projects implemented over the course of the twentieth century were not implemented based on self-consistent

logical considerations but on aesthetic grounds (Scott 1998). Even when the numbers did not add up and the science did not support such projects, these were advanced by experts captivated by what they saw as an opportunity to make reality into a simpler, more tightly ordered, harmonious whole. These considerations substantiate critical studies on political aesthetics that show how reactionary projects mobilize ideals of the beautiful and the sublime in order to naturalize expert rule and instill the idea that, despite socio-economic contradictions and cultural differences, all parts of the social body naturally belong within a pre-ordered, harmonious whole (Bourdieu 1984, Eagleton 2005 [1990]). In his contribution to debates within political aesthetics Latour argues that the experimental aesthetics he studied in Amazonia operated at odds with reactionary ideals of the beautiful and the sublime and undermined projects designed to make of the social body a wholesome composition.

Latour's argument hinges on his claim that experimental science does not depend on representational detachment. Critics of the ideology of the aesthetic demonstrate that a key part of techno-managerial rule consists in mobilizing visual representations of beautiful worlds that experts purportedly may bring into being. These representations (maps, documents, models) legitimize the construction of office space and institutional structures that materially isolate experts from non-experts and present the former as capable of bringing the world into harmony—in a process that advances as if extending the air-conditioned interiors in which experts work to encompass, ultimately, the entire planet. Techno-managerial, representational aesthetics is thus built on particular forms of alienation whereby experts remain insensible to the textured complexity of the worlds they inhabit and remain mostly ignorant of the unarticulated

wisdom of non-experts. From the technocratic interiors they inhabit, experts compose

designs that offer views of future worlds that despite their reductive simplicity hold a

dear, moving promise: that the world may re-arranged to the benefit of humans and,

therefore, that "what there is" is predisposed to embrace humanity. Ultimately, experts

embody the dream that the planet we inhabit awaits human (and particularly expert)

contemplation and fruition (as long as humanity gives itself to experts who will

eliminate those aspects of the world they deemed to be less than human).

Latour argues that open-air experimentation is fundamentally different from this

highly problematic political–aesthetic approach. He shows that in open-air

experimentation experts literally step outside atmospheres under total control and

expose themselves to dynamic situations that disrupt their views of the world. I advance

Latour's insights on open-air experimentation while departing from some of his

political conclusions. While he argues that the aesthetics of open-air experimentation

results in more inclusive and ample "insides" (material situations in which entities

establish productive and creative relations leading to hospitable worlds), I claim that

Latour's ethnographic data and my own demonstrate that experiments in the open may

lead to the dismantling of inner spaces in which humans may hope to build worlds that

may accommodate something resembling humanity. The critical mobilization of

Latour's aesthetic approach allows me to show that REDD+ proposals are non-

representational projects similar to Golbery's geopolitical plans insofar as they are *not*

intended to bring the region into a pre-determined order. In the first section of the

chapter I revisit Latour's ethnographic material, explore his aesthetic approach, and

argue that, contrary to techno-managerial aesthetics, the kind of expertise he and I study

is non-representational. At this point I also show that open-air scientific experimentation in Amazonia is connected to open-air experiments carried out by agro-industrial operations that bring into being monstrous worlds in flux. In the chapter's second section I focus on my own ethnographic data to show how the cultivation of sense perception in an open-air laboratory in Amazonia brings experts within shifting and animated but also potentially self-destructive human geologies. In the third and final section I elaborate on the idea of "wilderness without nature" to which I alluded in chapter two. I then strive to show how REDD+ schemes have responded to the sense perception that the world is indifferent to human efforts to make it more inhabitable.

Part One

Experimentation in the Open

Latour's expedition took place at a forest/savanna transition site in which Edileusa—a botanist who was part of the research team—had carried out systematic interventions over several years: she divided the terrain based on a Cartesian grid, tagged trees, and collected vegetation samples (Figure 31). Through these actions, Edileusa found out that, along a 20-meter-wide strip of the forest/savannah border, vegetation from both ecosystems grew increasingly intermixed. The news reached French scientist Armand Chauvel, who then organized the expedition to determine whether the forest was advancing over the savanna or vice-versa. As a soil scientist, Latour explained, Chauvel thought that soil erosion was leading to the advance of the savanna. As a botanist, Edileusa thought that vegetation dynamics were expanding the forest.

Figure 31. The kinds of intervention that created Latour's open-air lab. From: *The "Pedofile" of Boa Vista. A Photo-Philosophical Montage*. 1995 [1993]

Latour explains how the scientists' questions and opposing assumptions were

possible thanks only to Edileusa's building of a laboratory in which processes that thus far had remained latent were brought into view. The experiment at this lab, however, was neither designed nor carried out by the scientists. The shift in vegetation patterns was unplanned and was discovered after the fact—as if Edileusa had built a laboratory only to realize that an experiment was already being carried out by unidentified entities following a hidden plan of action. Chauvel's expedition was not intended to impose a scientific plan on this site, but rather to contribute to the laboratory and to determining how to carry out the ongoing experiment with a new set of tools, among which the "pedocomparator" was particularly significant: a rather simple square box with an interior grid (ten rows by ten columns), it allowed scientists to arrange soil samples gathered at various depths side-by-side. Figure 32). It therefore made it possible to generate a detailed visual profile of the underground along a transect across the forest–savannah border.
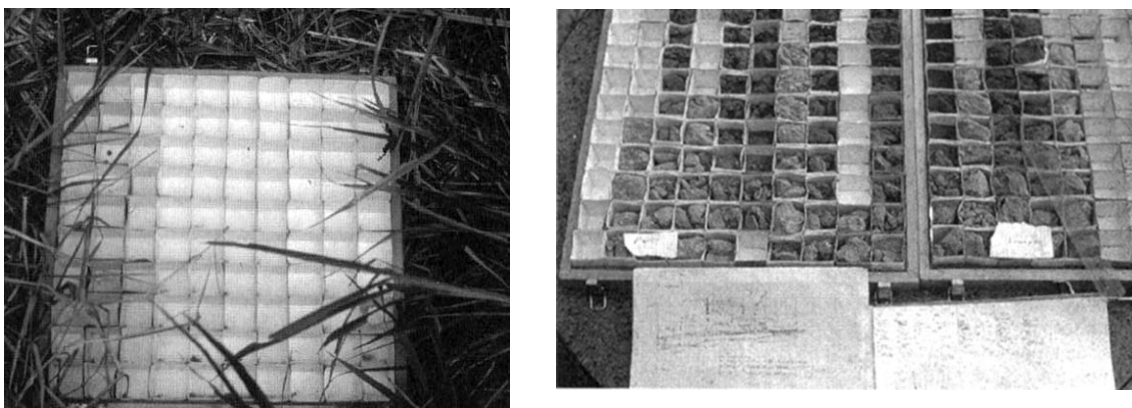
Figure 32. The pedocomparator. From: *The "Pedofile" of Boa Vista. A Photo-Philosophical Montage.* 1995[1993]

In its simplicity, the pedocomparator had remarkable aesthetic powers as it demanded that scientists be systematic in their sense engagements in the forest. And so

Latour and colleagues devoted long hours to digging holes, examining the color,

texture, and composition of soil samples, and molding soil fragments so they could fit

the pedocomparator. The tool also made possible a chain of transmutations: the forest's

soils were turned into samples and the samples then became "profiles" that allowed

scientists to compose images that rendered perceptible subtle variations in the soil

underneath the forest/savanna area. Latour claimed that by effecting these

transmutations the pedocomparator rendered the forest into a "traveling referent": a

portable image that carried with it some of the forest's material attributes to distant

places where scientists could work on unveiling elusive ecological processes (Figure

33).
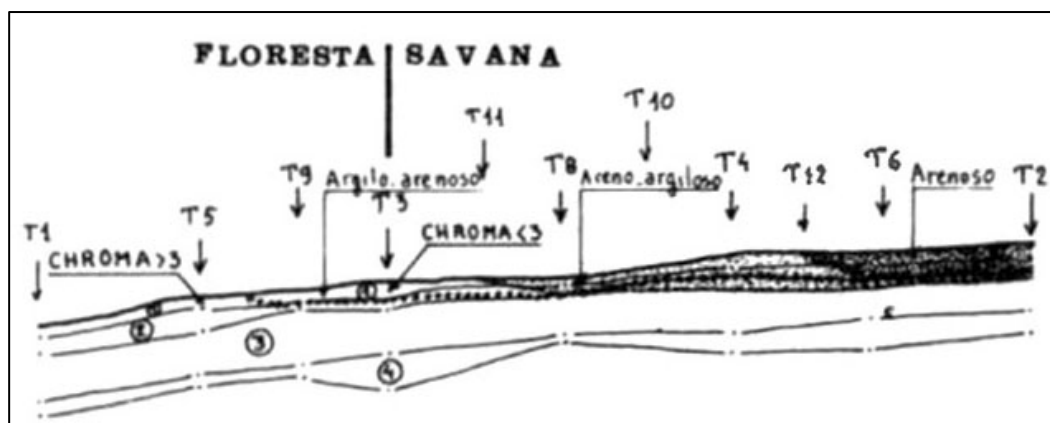
Figure 33. Sub-soil profile. From: *The "Pedofile" of Boa Vista. A Photo-Philosophical Montage.*
1995[1993]

The pedocomparator showed Edileusa and Chauvel that, contrary to their

expectations, the soil below the forest/savannah border was similar to the forest's

underground—as if vegetation shifts were preceded by changes in the soil. The

expedition's question was consequently reformulated: either the forest was creating its

own soil and preparing conditions suitable to its expansion or, to the contrary, the

savannah was degrading the forest's soils and pushing forest vegetation back. The scientists concluded that Amazonian earthworms were behind this riddle: living at the forest's borders, they ate sandy savannah soils and excreted material with higher clay content, thus transforming the savannas' underground into matter over which forests could grow. The worms thus suddenly appeared as entities whose creative capacities could counter the entropic forces that tend to turn soils into sands.

Figure 34. Chauvel sitting in his office. From: *The "Pedofile" of Boa Vista. A Photo-Philosophical Montage*. 1995[1993]

Latour ended his essay with a picture of Chauvel typing at his computer in front of a large map of the Amazon (Figure 34). The author invites us to see in this picture a scientist whose open-air research did *not* frame the forest as an object whose truth

experts could contain in a single image. Edileusa and Chauvel were not in the position

of alienated technocrats who, from their air-conditioned rooms, thought of themselves

as needing to distance themselves from the forest in order to access the truth of

Amazonia. Latour suggests that Chauvel's experimental interventions, much like those

of wiggling earthworms, took the forest (in the form of traveling referents) to academic

audiences across the world—thus blurring the boundaries between the forest and spaces

of scientific practice. As an aesthetic practice, open-air experimentation consisted in

sensuous engagements that, rather than representing a reality "out there," allowed

scientists to walk into the open where they could feel, see, and take into account

observable phenomena as participants in the construction of the world. Open-air

experimentation was synonymous with immersion and the cultivation of a taste for the

disruption of assumed orders.

In Latour's ethnography, thanks to experimental practices, Amazonia can be

seen to "make sense" not as a doomed region but as a dynamic space—its forest cover

growing, permanently recomposed through the collective actions of non-humans.

"Knowledge," Latour concludes, "does not speak of a real exterior world that it would

resemble via mimesis, but rather, of a real *interior world*, the coherence and continuity

of which it helps to ensure" (Latour, 1995[1993]: 170, emphasis added).

Non-representational Aesthetics

Latour's ethnography was sub-titled "a photo–philosophical montage" and his

aesthetic claims are closely related to the argument he had made a few years earlier in

We Have Never Been Modern. There he claimed that his ethnographic work belonged to

a time in which "anthropology comes home from the tropics" (Latour 1993[1991]: 100).

Citing Descola's *In the Society of Nature* and Lévi-Strauss's *The Savage Mind*, Latour suggested that scientists could be studied in the same terms as the Achuar; they could also be approached as "tribes" that like "premodern" peoples classify beings according to their perceived capacities. For example, scientists often classified humans as uniquely positioned in relation to the rest of Nature. Within a sea of raw matter moved by the mechanics of automatic causation humans provided the only instance of beings who were capable of bringing creative innovations to the world. Such a stance, Latour argues, places humans at heights from which they are capable of composing a total blueprint of the world but only at the price of occluding socio-natural mixtures and the creativity displayed, for example, by the earthworms that contribute to the expansion of Amazonian forests.

At the same time, Latour stresses that some scientific tribes may destabilize dominant categorizations. Unlike the "primitives" who were seen by Lévi-Straus as belonging in "cold societies," some scientists are experts at designing and managing radical de-totalization projects that are not counterbalanced by re-totalization dynamics. The open-air experiment in Amazonia, for example, disrupted scientists' initial understandings of how forest and savannas interacted and its conclusions may be seen as undermining ideas about the capacity that non-humans (objects and animals) have to transform the texture of the world (for an interpretation of Latour's ethnography along these lines see: Harman 2009, Bennett 2010). According to Latour, open-air experimentation did not alienate humans from textured, complex worlds, nor did it instill a gap between scientists and the world. It rather belonged to the type of science that *exposes* scientists to scents, sights, and feelings that are excessive and "monstrous"

in relation to dominant ontological classifications (which is to say, with commonsensical understandings regarding which entities inhabit the world, what capacities they bear, and which worlds are made possible by their interactions, see: Latour 1993[1991], 2004, 2011). Unlike the reactionary tenor of the ideology of the aesthetic (wherein elites appeal to the senses in order to present the total order as unavoidable/desirable), experimental, non-representational aesthetics disrupts commonsense orders, immerses experts in their object of concern, undermines the idea that a total composition is possible and leaves "nothing . . . off the table" (Latour 2004: 455; 2005). Aesthetic fruition in experimentation comes *not* from contemplating achieved beauty but from experiencing the interesting, never-ceasing emergence of uncertain worlds (Yusoff 2009, Yusoff and Gabrys 2011, Gabrys and Yusoff 2012).

Latour and other scholars who advance ethnographic and theoretical insights stress the anti-reactionary character of experimental aesthetics and assume this suffices to avoid the potential dangers of the politics of the aesthetics. Although their point is well taken, it offers nothing but silence regarding the potential problems that could arise as persons and groups learn to live alongside monsters and expose themselves to the tremors of continuous de-sedimentation. This blind spot is, I think, associated with a certain Eurocentrism that pervades the non-representational study of experimental aesthetics. The underexamined assumption in this literature is that Western ontological understandings regarding Nature, Beauty, Order, Culture, and so on are at the root of unfolding global socioecological problems. Capitalist expansion and state rule, for example, are seen to require the framing of the world as a sphere of seamless circulation wherein heterogeneous entities may be represented in terms of monetary values and

normative injunctions. The rule of experts, whether CEOs or statesmen, would be such that it would physically mold non-human elements into raw matter passively awaiting the hands that will turn it into building blocks of a total work of art (into for example, commodities for global transactions or elements under sovereign rule). From this viewpoint, that which disrupts practical naturalist understandings and short-circuits the idea that the world may be brought within a wholesome order seems intrinsically desirable. The undeniable merits of this critique lie in the idea that the disruptions of such orders would entail the disruption of the violence that, under the shadow of beauty, erases or eliminates parts of the world (ecologies, forms of life, modes of engaging with the world) that are ignored or deemed unworthy of being included in prefigured compositions.

The problem, however, is that this perspective (in a well-intentioned but Eurocentric way) assumes Southern populations to be either innocent bystanders, co-opted forces, or parties that bravely resist the onslaught of Western naturalism by introducing unassimilable excesses into totalizing projects. A more complicated picture emerges when we consider how dominant projects of expert rule that have transformed Amazonia have *not* been driven by Western projects designed to integrate the region into a global, beautiful, seamless oeuvre. As I have claimed in this dissertation so far, in the history of Amazonian transformations local, regional, and national projects have been advanced by parties that have aggressively sought to *undermine* the representational aesthetics of Western naturalism. This point can be seen more clearly by situating Chauvel's research and Latour's ethnography within the historical flux of Amazonian de-sedimentation. As we will see, even Brazilian corporations seem

perfectly capable of non-representational efforts carried out in collaboration with monstrous figures and of capitalizing on the absence of Nature.

Experimenting with the Monstrous

Neither Latour nor other scholars who elaborate on his Amazonian ethnography mention the fact that Chauvel never published the results of the brief expedition to which Latour contributed—and which suggested that *forest expansion* occurred thanks to Amazonian earthworms. Chauvel's most important publication regarding earthworms would appear in *Nature* in 1999 and was based on decades-long multi-sited research that linked various experimental sites across the Amazon basin. He there concluded that *earthworms hampered forest growth* (Chauvel, Grimaldi et al. 1999). Chauvel's work focused on an earthworm known as *P. Corethrurus* which was described as an "aggressive exotic colonist" unwittingly introduced by humans into agricultural lands in which they proliferated thanks to their capacity to thrive in low-nutrient, degraded soils (in which native soil fauna dwindled). In ecologies altered by human actions the earthworm could comprise more than 90% of the soil's fauna, and its excretions—as much as 100 tons of highly compact clay per year per hectare—saturated the soil's upper levels with a solid crust that disrupted water and chemical exchanges between soils and the atmosphere. These earthworms thus behaved as a soil degradation agent undermining the re-growth of forests and Chauvel thus describes them as "more insidious" than bulldozers or cattle (*idem*, Figure 35). Chauvel's open-air experiments brought to the senses a worm that, as a truly monstrous entity, echoed and amplified human impacts disrupting environmental processes at regional and global scales (*idem*, see also other publications to which Chauvel contributed: Barros et al., 2001; Barros et

al., 2004).
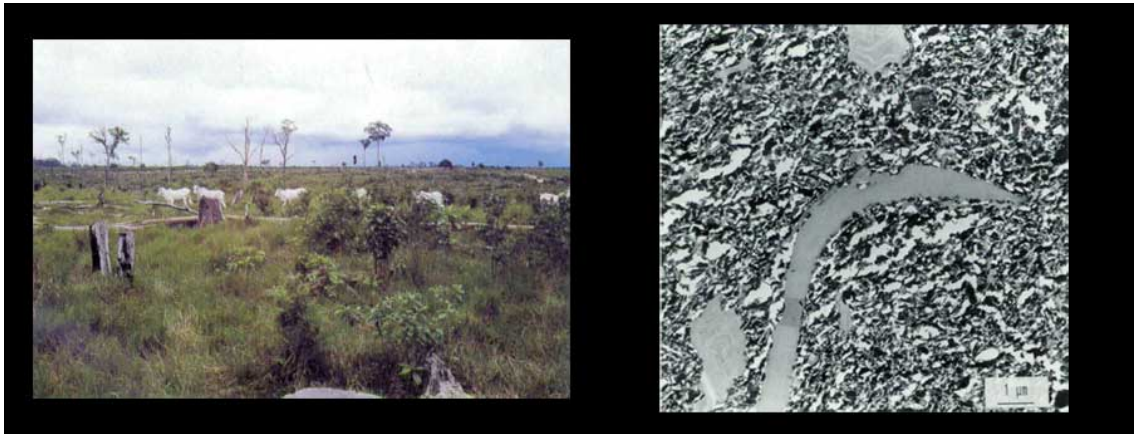
Figure 35. Chauvel's published worms. From his co-authored article: *Effets de la Deforestation et des Cultures sur la Structures des Sols Argileux Dans l'Amazonie Brasilienne*. M. Grimaldi, M. Sarrazin , A. Chauvel, et al 1993

Chauvel did not necessarily blur the boundaries between scientific laboratories and expanding forests nor did he announce the progressive composition of warm interiors composed by human/non-human collaborations. The monsters he brought to the senses blurred the boundaries between sites of scientific practice and the global expansion of ranching operations, the dissemination of foreign species, and the depletion of soils. The experiment Edileusa encountered, then, was not confined to shifting local ecologies emerging in kaleidoscopic re-orderings but were part of the never-completed work of de-sedimentation thrust forward by planetary socio-techno-economic fluxes.

Chauvel's published work was by no means exceptional and it conveys the defining traits of the most important open-air experimentation campaign in the history of Amazonia (and one of the most important to have taken place in the world): the *Large-Scale Biosphere–Atmosphere Experiment in Amazonia*, or LBA. During the LBA's more international phase (1998–2006) the experiment brought together more

than 1,700 scientists and 200 institutions from Brazil, Europe, and the United States (Nobre, Dolman et al. 1996, Artaxo 2012). Although LBA projects were extremely varied, they all focused on human impacts on macro-ecological processes (although some of Chauvel's collaborators during his professional life were important LBA members, he was not an official part of the program). The experiment entailed massive deployments of instruments that, as Myanna Lahsen's studies have shown, allowed LBA scientists to play central roles in public discussions regarding the changing role of Amazonia in supporting global environmental conditions of existence (Lahsen 2004, Nobre, Lahsen et al. 2008, Lahsen 2009).

One way to understand the LBA is to place it within the history of field experimentation in Amazonia. As I argued in chapter one, when environmental scientists worked in the region in the late 1980s they witnessed, experienced, and plunged into worlds in violent recomposition. When computer modeler Robert Dickinson visited Amazonia in the late 1980s as part of Paul Crutzen's field experiment, fires from forest clearings were so numerous and intense that, in large cities in the region, airports were closed and cars had to use headlights before sunset. His take on the situation, however, did not focus on what was being lost under a thick layer of smoke, but on how the experimental remaking of the world offered new scientific opportunities. He argued that

> It is readily imagined that in the future much of the Amazon will become degraded pasture, perhaps with extensive shrubby growth. *The removal of the forest is a unique geophysical experiment in progress*, presenting climate modelers with an opportunity to understand the role of forests in the climate system and especially their connections to the hydrological cycle. (Dickinson 1989, emphasis added)

The scientists with whom I worked (also mentioned in chapter one) advanced Dickinson's and Crutzen's insights and engaged with Amazonia as a human geology in experimental transformation. In a way, the LBA was deployed as a second-order experiment, an effort to track undertakings advanced by forces that were not under expert control and did not follow a clear experimental plan. As researchers followed the experimental remaking of Amazonia as it was carried out by generals, corporations, land speculators, illegal miners and others, their scientific work led to radical shifts in the understanding of Amazonia. While in the early 1990s scientific literature described the region as a "system in equilibrium" in need of human protection, recent scholarship summarizing LBA results fashions titles such as *Amazonia and Global Change* (Keller, Bustamante et al. 2009) and *The Amazon Basin in Transition* (Davidson, de Araujo et al. 2012). This literature argues that the region is advancing towards a "disturbance dominated regime" in which ecological policies should not be designed to arrest change to preserve an order under threat, but instead should be structured to "manage both biophysical and socio-economic transitions" (*idem*: 327).

Rather than trying to unveil a "real," "natural" Amazonia lying beneath the "artificial" impacts of ranching and agricultural ecologies, LBA scientists with whom I worked collaborated with farmers and ranchers to study anthropogenic ecologies as an intrinsic part of the basin's macro-ecological dynamics. Most famously, LBA scientists shifted their research projects to take into account the environmental impacts derived from the rapid expansion of agroindustrial farms in Amazonia. Whereas Latour described how Edileusa discovered in her field an ongoing experiment driven by subtle chains of non-human interactions, it is possible to argue that what Latour was actually

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describing was scientists immersed in an experiment of planetary proportions driven by capitalist operations. In order to lay the groundwork for an interpretation of open-air experimentation that would address the shortcomings in Latour's analysis, I now describe in some depth the capitalist, agro-industrial experiments with which my interlocutors engaged.

Figure 36. Farmers and agronomists discuss worms in an agro-industrial plantation in a forest/savanna transition area in Southern Amazonia.

Agro-Industrial Experiments

Only once did I encounter earthworms as a topic of discussion during my fieldwork (Figure 36). This happened at a forest–savanna transition area at the southern edges of the Amazon basin (Latour's ethnography, also carried out in an area of ecological transition, took place at the northern edge of the basin). Over the past three decades forests in this region were replaced by massive capital-intensive agro-industrial plantations whose macro-ecological impacts were under study at the time of my visit. I was at this place in order to observe an open-air experiment advanced in the midst of

export-oriented soy plantations. The worms in question, however, were an issue not for the environmental scientists who worked in the area but for the local agro-industrial farmers. With the latter I took part in a "field-day" (*dia de campo*) organized by Brazilian research institutions who wanted to introduce local producers to strategies for consolidating their position in global rural commodity markets (Figure 36). The worm was discussed in this context as a pest, one of various challenges farmers faced as they struggled to "de-commodify" their product and "free" the soy they produced from global commodity chains controlled by companies like Monsanto.

Figure 36. Farmers and agronomists discuss the result of an experimental harvest.

The agronomists who led the event explained to their audience that in order to be successful in global rural commodity markets it was not sufficient to cheaply produce a tradable good (in this case soy) to which a monetary value could be assigned. In today's global commodity markets, they argued, producers had to collaborate on the

construction and permanent maintenance of a chain of researchers, producers, and consumers who, like cogs in a global machine (*engrenagem*), would transform capital, knowledge, inputs, and soils into a series of differentiated products. The main challenge they addressed, agronomists claimed, was the dominance of corporations from the United States that were pushing for a rural production model wherein 85% of the world's soy production would be based on genetically modified organisms (GMOs) and only 15% on non-GMOs. Given that GMO seeds were under copyright held by companies like Monsanto, a GMO-based rural production model would hand a virtual monopoly to foreign corporations and make producers in Amazonia dependent on costly foreign inputs. "The producer will not be able to choose," the event organizers argued. "Someone else wants to decide what is going on on your lands," they added. As an alternative, agronomists were proposing *Soja Livre* or "Free Soy," a program to link research, marketing, and agro-industrial techniques to establish a commodity-chains alternative to those centered around Northern corporations.

Figure 38 Farmers and agronomists discuss non-commoditized agro-industrial soy.

Developed by Brazilian agro-industrial corporations (some native to Amazonia) in

partnership with Brazilian research institutions, Free Soy was described as an effort at de-commodification (*de-commoditização* Figure 38). As "a thing of the future coming to the present," de-commodification was explained as a new mode of agro-industrial production whereby farmers would help in building a "whole chain of production." Farmers had to strategically adopt some inputs (such as non-GMO seeds developed by Brazilian research institutions) and establish partnerships with NGOs that could help certify their products were non-GMO. The plan included convincing corporations such as Unilever to resist Monsanto's pressure to identify in their products the use of non-GMO derivatives as well as to enter more aggressively into European markets in which non-GMOs could earn a premium. To produce soy involved not only the already-complicated task of making a discrete, fungible thing that could easily flow and be valued in monetary terms. Farming also required building and making explicit global relations, flows of information and goods as well as putting in place chains of transmutations that would link particular farms and specific markets.

The event's organizer pointed out that farmers who decided on this approach had to be self-aware in their use of technologies and take into account issues at the "molecular" level. One of the most fragile elements of soy production was reliance on the "molecule of the glyphosate," a powerful herbicide that was being overused and causing the emergence of super-weeds (weeds that were resistant to most agricultural inputs save manual eradication and a powerful cocktail of powerful and costly chemicals). Rather than blindly applying these chemicals in the hope that they would resolve all their problems, agronomists argued that farmers had to learn to be more creative in their use of inputs and selective in their practices. They could rotate crops

and limit glyphosate dispersion through various weeding techniques. As one of the presenters put it, an assortment of molecules (not a single one) should be used together with various farming technologies and seeds, keeping an eye on maintaining a strong operation that is capable of accessing diverse markets. There was no one single method that could guarantee entry into a single sphere of commodity circulation and farmers could not afford to stop experimenting.

Figure 39. The effects of worms in agro-industrial soy.

It was in this context that the worms were discussed (Figure 39). They were thriving in the conditions of industrial agriculture. Their eggs were transported in trucks' wheels, they benefited from no-till agriculture, crop rotation, and the application of agricultural lime (an input used to reduce the acidity characteristic of Amazonian soils). The earthworms released a chemical that caused the root systems of soy plants to grow

horizontally rather than deeper into the ground, which reduced yields. Agronomists explained that the response to the worms could *not* be total extermination but instead required localized solutions that would allow farmers to reduce their numbers and make it possible for soy crops to thrive *alongside* worms. Farmers should first take soil samples and send them for biological analysis in order to determine which kind of worm was affecting their crop. On the basis of this information they could select from among diverse soy seeds and choose from among a variety of possible rotation systems and rotation crops. Farms would then be attuned to the earthworm's reproductive cycle and dietary preferences and in the process the worms would pay farmers a service: they would force them to gain greater familiarity with their soils and with a range of technological options available for soy production.

This approach to the worms defined the tenor of conversations among farmers at the event. Farmers discussed how corporations could make them into captive consumers of high-cost inputs and quasi-forced providers of low-cost commodities. Brazilian research centers and corporations were striving to disrupt the commodification machinery that made one particular kind of soy (copyrighted, GMO, RoundupReady soy) stand metonymically as *the* soy that could be produced and traded. This Brazilian farming strategy was thus an agro-industrial *coup* whose ultimate goal was to break apart (with the help of molecules, plants, worms, inputs, traders and consumers) the infrastructure based on which Northern powers had put in place a sphere of circulation whose assumed neutrality precluded other alternative agro-industrial arrangements.

Graham Harman argued that Bruno Latour's approach to the study of open-air experimentation in Amazonia offers a description of scientific truth that does not use an

"optical or pictorial metaphor" but an "industrial metaphor" (Harman 2009) 77. "The

truth of whether the jungle is advancing or receding" Harman claims, "is instituted . . .

by [a] lengthy chain of actors," and it comes not as an image but as the outcome of a

long chain of transmutations (Harman 2009: 76). Sandy soils are turned into clay matter

by worms' digestive systems, these excretions are rendered into soil samples with the

help of the pedocomparator, and the samples are transported and rendered into a

diagram that is then incorporated into a report that, Harman wrongly suggests, is

eventually published. The environmental politics Latour champions trade on this

industrial sense of truth. Rather than aiming at realizing the image of Amazonia as a

beautiful, wholesome space that offers itself to human contemplation, Latour suggests

that environmentalists should instead place themselves within chains of transmutation,

and proceed to establish new relations with non-humans alongside which they could

effect radical transformations. Worlds thus composed would be truthful (scientifically,

environmentally) not by virtue of their correspondence with an elegant design or theory,

but by virtue of the strength and intensity of the flows and interconnections that would

hold it together.

The limits of Latour's proposition come to the fore when we consider that the

experimental recomposition of the world for which he advocates does not take place in

worlds inhabited only by scientists, trees, worms, and Amazonian soils. All of these

elements are there, to be sure, and all play rather creative roles. But these entities are

also immersed in the global, experimental intensification of capitalist operations—to

which he turns a blind eye. The scientists whose open-air experiment was surrounded

by the aforementioned agro-industrial farms were particularly sensitive to the

experimental qualities of agro-industrial expansion as their scientific efforts, as I will

now show, were designed to plug into surrounding capitalist experimentation.

Part Two

Experimental Catastrophes

Figure 40. Scientists walking in their open-air laboratory. Agro-industrial plantations stand at their left. Native forest/savanna transition vegetation at their right.

The Open-Air Laboratory

In 2012 I visited an open-air laboratory in a forest/savanna transition area in Amazonia built by a science team some of whose members had been part of the LBA (Figure 40). The laboratory comprised lands classified into three types: "undisturbed forest," "degraded forests," and monocrop farmlands. At monocrop sites it was farmers—not scientists—who carried out extensive experiments (although there was considerable scientific equipment on the plantations). Meanwhile, forest sites teemed with scientific activity. For the better part of a decade the team opened pathways in the forest, forming a Cartesian grid that allowed them to choose a number of sites they would study in great detail in order to obtain a statistically significant

picture of forest dynamics. The grid also helped scientists organize the deployment of

10-meter-deep pits dug in order to monitor underground humidity. Meanwhile, dozens

of sensors distributed across the area measured aboveground temperature, humidity,

rainfall, and solar radiation. A large set of strategically distributed nets captured

litterfall (dead leaves and branches) while measuring belts that were permanently fixed

to dozens of trees monitored biomass growth. At various spots traps monitored the

growth of micro-roots while dozens of tubes protruding from the ground allowed my

interlocutors to plug in equipment to measure "soil respiration" (the amount of carbon

dioxide emitted by soil processes) (Figure 41).

Figure 41. Interventions at the open-air laboratory. Left: trees marked that identify them as part of a sample under detailed study. Right: a net captures deployed to capture litter fall.

However, the most important intervention carried out in the forest involved

periodic disturbances through which the science team placed various forest sites under

varying levels of environmental stress. The idea was to simulate the conditions that

could become more common in the region's future. In 1997, 2005, and 2010 a series of

"one in a century" droughts had recently taken place in the basin and scientists were

particularly concerned that this was part of a major macro-ecological shift. Drawing on

the field experiments carried out in Amazonia since the 1970s (see chapter one) as well

as on more recent LBA results, the team was assessing the strength of the "Amazon forest dieback" hypothesis. According to this idea, changes in the hydrological regime could be part of a broad micro-ecological shift. As farmlands and pastures had rapidly extended in the past decades, rain regimes had apparently been disturbed, leading to a dryer climate in forest savanna transition areas like those in which the laboratory was built. The dryer climate seemed to be allowing fires that are common in the savannas to extend into the forest, thus allowing savanna vegetation to expand into the forest as well. Scientists feared that these chains of relations, transformations, and transmutations were becoming self-sustaining. More fires would lead to more savannas, to less forest, to a drier climate, and finally to more fires.

Figure 42. Native vegetation dwindles under induced environmental stress.

By placing various plots under varying degrees of stress while studying them up close, scientists could assess how environmental changes lead to shifts in vegetation mortality, species distribution, biomass production rates, and greenhouse gas emissions (Figure 42). The objective was similar to Chauvel and Edileusa's only in the broadest terms, as scientists were assessing whether savannah ecosystems were expanding or not. My interlocutors, however, placed the relation between macro-ecological process and

human-driven disruptions at the center of their project.

Amazonia was addressed as an experimental site composed by a shifting web of heterogeneous processes, as a young scientist working in the laboratory stated:

> land use change, biodiversity loss, food production, and expansion of agricultural areas, these are all interlinked factors. So it is a web. Whatever you do you will affect all [other] processes. [Environmental issues] have to be tackled in a very broad way in order to imagine these processes together.

The scientists studied hybrid and precarious ecologies wherein changes in one domain reverberated and triggered changes in some other domain. Under these conditions it was particularly hard to understand how the region's various processes and entities related to one another, influenced one another, and transformed one another. To shed light on this complex meshwork, scientists made significant investments in vast, powerful equipment capable of bringing to the senses even the more tenuous processes. The most senior researcher at the laboratory during my trip, a scientist I will call Margaret, was starting a long-term collaborative project with the scientist who built the open-air laboratory. Margaret's contribution to the experiment was a set of eddy flux towers like dozens of others her institution had helped to build across the world. The towers were loaded with instruments that generated real-time "data streams": tens of measurements per minute on land-atmosphere exchanges (water, carbon and other trace gases) as well as data on climate (temperature, solar radiation, etc.). The laboratory would soon be brought within a "vast machine" of global environmental observations (Edwards 2000) wherein streams of information would cut across Amazonian sites and research centers across the globe (Figure 43).

But the sensory engagements facilitated by the laboratory were not limited to

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highly formalized and institutional flows of information. Whenever she had some free time at her disposal, Margaret ventured into various locations to take soil samples. Her actions were reminiscent of Latour's description of Chauvel's engagements—although Margaret had no pedocomparator and her operations were unsystematic and improvised. She wanted only to gain a sense of the place to which she would be connected over the following years via streams of data.
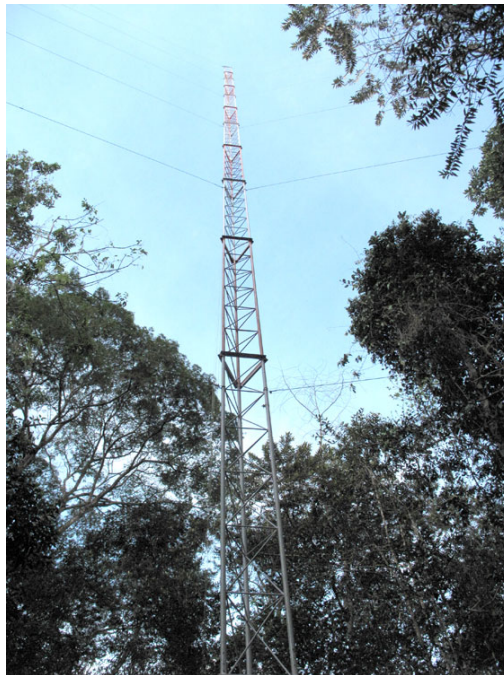
Figure 43. Eddy flux tower under construction.

Anthropocene Aesthetics

On the first day of her visit, Margaret took a break from a tour around the experiment and carried drilling tools to a site in which forests bordered monocrop plantations that extended over tens of thousands of acres. She dug vertically, extracting soil samples as large as a baseball and passed them on to others who laid them on the ground in order of extraction—thus building a rustic profile that showed a sandy composition at the top and a clay-like consistency at the lower levels. Margaret taught

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us to study the samples by adding a little water to them and pressing them between our

fingers (Figure 44). She encouraged us to smell the earth, compare the colors of samples

and even persuaded some of us—those whose enthusiasm overcame concerns about

agrochemical concentrations—to taste tiny bits of the underground in order to determine

the presence of saline elements. As we manipulated the soil, my companions discussed

the probable history of "soil disturbance" that was made explicit in this profile. A more

rigorous study, Margaret speculated, would find a deep layer with traces of a once-

existing forest. Then, the observer would find a succession of rapid shifts: the forest was

burned down, a ranching site and cattle ground had been established, and some years

later mechanized agriculture had arrived. The top layers would contain biomass from

genetically modified harvests, the remnants of recent commodity shipments to China

and Europe.

Figure 44. Margaret manipulating a soil sample.

Sense experience was an important part of Margaret's explanation of the work

she carried out at the lab. The main questions the towers were intended to answer, Margaret argued, were "obvious when you walk through monocrops or pastures" (Figure 45). In anthropogenic spaces, she said, "the air is hotter than in the forest, even when you stand in a clearing [in the middle of the forest] where you receive the same amounts of solar radiation." The explanation of such differences in atmospheric temperatures, she explained, was that in the forest the energy received from the sun is dissipated back into the atmosphere as plants transform water into vapor that rises into the air. This transfer of energy is sensed as "latent heat," which is to say as humidity and not directly as temperature. Meanwhile, the lower-growing vegetation of the monocrops captures less water, creates less water vapor, and reflects the sun's energy back into the atmosphere as "sensible heat" that warms up the air.

Figure 45. Margaret and colleagues in the mono-crop field.

Margaret's study of such changes from the latent to the sensible and her unsystematic sensory engagements offered insights into much larger issues and unsettling Amazonian futures. She was asking whether there was "some critical

threshold that you [may] reach," a point at which large-scale agricultural disturbances will lead to a "feedback loop" or a reinforcing collapse that would bring about a situation in which, she said, you "lose the rest of your forest. [pause] You risk losing the rest of your forest."

More than a century before our conversation, a few hundred miles away from this laboratory in a similar ecological transition area, Rondon had raised telegraph poles expecting these would carry flows of information that would gradually compose a well-ordered totality. The human intellect, Rondon thought, could be aided by this flow of information when deciphering the invariable laws of Nature that were the background of human life. And once Nature's secrets were unveiled, humanity would be at home anywhere, as it were, insofar as persons and groups would be able to master the defining principles of matter anytime and anywhere. With the towers humanity would rise above Nature and contemplate a definitive and well-ordered totality. Although Margaret's construction would also link the region with faraway places across the planet, her project did not carry the hope that one day the earth could be a thoroughly familiar place. She and her colleagues were in a lab that was nowhere near a stable, natural background based on which invariant ecological relations and Natural laws could be determined for anytime or anywhere. The laboratory was built in a place of rapid transformations in which mutually affecting entities and processes were creating unprecedented and non-analogous, non-replicable transformations. Margaret was an enthusiast of Anthropocene ideas and her approach exemplified my interlocutors' engagement with shifting human geologies that foreclosed the possibility of complete scientific understanding. "The world is catching up on us," Margaret claimed:

People won't stop messing with stuff [and] now many things are changing. Climate is changing, CO_2 levels are changing. You know? Air pollution is increasing, particles in the atmosphere are increasing . . . we are dumping more nitrogen on ecosystems. . . .You name it! All is different. And in a big way. So the hard part is not observing change, but trying to attribute it, to, to locate it. . . . It is frustrating because everything is changing, and everything is changing so fast, that [pause]. But if you want to learn about a system one way is to push it really hard. That is what we are doing. So, you know? We may as well watch.

Margaret' skills—and those of her colleagues—were precisely those needed to "watch," feel, sense, and engage with worlds that resisted being reduced to a single, totalized ordering. Her experimental practices and techniques (the towers, the systematic measurements, the flows of data, the trips to Amazonia, and her bodily engagements with Amazonian materialities) were useful for engaging with biophysical realities sensed as bearing much dynamism and creativity. The polluted worlds she addressed were not docile and lawful, lying deterministically, waiting to be explained. The entities that were seem to compose this region (and Amazonia and the Earth System at large) were animated and constantly interacting with one another in ways that were capable of accomplishing fundamental transformations in biophysical systems. Rains, fires, forests, farms, humans and savannas, for example, created "feedback loops" that literally transformed the texture of the world.

Although human actions such as the dumping of nitrogen, the emission of carbon dioxide, and the felling of trees were "frustrating" for Margaret (and she understood their violent repercussions better than most) in her research these things were nonetheless "truthful"—in a very particular way. Human actions "pushed" the world to extremes and thus brought to light the specific mechanisms through which

non-human entities shifted behaviors and related differently with one another. Woven into the fabric of macro-ecological dynamics, human disruptions were not an excess that needed to be eliminated to reveal the true nature of Amazonia; they were instead a *constitutive* excess that offered invaluable insights into the truthful creativity of worlds that were undergoing potentially catastrophic transformations. Within worlds that "catch up on scientists," the truth delivered by humans foreclosed the possibility that an elegant set of formulas could explain ecological processes anytime and anywhere. Truthful scientific assessments were contingent and required constant actualization through a system of permanent experimentation that could be materially plugged into human infrastructures, driving planetary disruptions. Sound environmental conclusions would not amount to a definite picture (visual or mathematical) that would show all the world's entities belonging together in a single beautiful composition—as if the order of the cosmos was preordained to be contemplated with human eyes and arranged in such a way as to offer humans shelter. Rather, open-air experimentation brought to the senses a rather unsightly world, one that was never anticipated to remain still and in which human conditions of environmental existence could not be taken for granted. The worlds Margaret brought to the senses were profoundly indifferent to human ideas of beauty and offered no privileged grounds from which humans could hope to know the world or how to make it harmonious. It was Margaret, after all, whom I quoted in chapter one stating that "we will not know what we measure before we lose it." When knowledge comes by the hand of destruction it is impossible to await an endpoint at which the world would become transparent.

The work of scientists at the lab I visited was based on permanently training

themselves in the art of examining and taking part in excessive and unsightly de-sedimentation fluxes that carried the possibility of futures in which there would be no place for humanity. This becomes clearer in the next two sections as I focus on the concrete experimental practices advanced by my interlocutors and the environmental management schemes resulting from their scientific work.

The Experiment: On Killing Trees

As we walked around the lab my interlocutors constantly compared their efforts with those of previous research projects from which they borrowed questions, methods, and techniques. Margaret, for example, told us the story of a scientist who, over the course of several months, tried to "kill a tree" in a pioneer rain-exclusion experiment. In her story, the experiment consisted in restricting rainfall on a plot in the middle of which a large tree stood. The idea was to trace the tree's physiological changes as it underwent water stress. The experiment, however, ran into trouble when the tree continued to live seemingly unaffected; it had somehow accessed alternative water sources. In response to the tree's unexpected response the scientist expanded the rainfall exclusion area and dug a trench all around the site in order to limit underground water infiltration. And yet after all that, Margaret told us in laughter, the tree survived, forcing the scientist to abandon the experiment.

The scientist's failure to "kill the tree" was particularly fascinating for my interlocutors as it proved a point that was extremely dear to them: plants respond in creative and unanticipated ways to human actions and to each other's behavior. When scientists explained this point to me (which they often did) they repeatedly referred to

an LBA experiment that had been carried out somewhere else in Amazonia. This experiment simulated a four-year drought by deploying plastic-foil panels over one hectare of Amazonian forests in which up to 60% of total rainfall was excluded. Some months into the experiment, as a scientist involved in the project put it, "some trees started to. . . . [pause] Let's say they went crazy." By which he meant that unanticipated plant behavior was observed. For example, some trees transformed their root systems by growing larger capillary roots close to the surface where they captured moisture and, in some cases, redirected humidity *downwards,* from the surface and towards drier, lower soils. Over the short term, the site's vegetation showed "resilience" to hydric stress as plants exhibited a wide repertoire of responses to the scientists' actions. Tree mortality was thus lower than anticipated, particularly among large trees. Then, in the fourth year of the simulated drought things rapidly changed as large-tree mortality spiked beyond anticipation, suggesting that a threshold had been crossed. As large trees began to die they left under-canopy vegetation exposed to direct solar radiation, further undermining the living conditions of smaller plants. At this point plastic panels were removed, and the study focused on how degraded forest recuperated with the return of rainfall.

The experiment I visited was similarly designed as my interlocutors anticipated that Amazonian ecologies would offer rather creative responses to unfolding ecological crises. The conditions of the region in which the laboratory was located were ideal for this approach. Here change was easily graspable, as Margaret made clear, but the challenge was understanding how to balance the disappearance of ecological systems by bringing to the senses their late creativity. Scientists had to operate under conditions in which their ultimate object of study (the Earth System) faded out and withdrew into

disruptive forms. As one of Margaret's most senior colleagues working on the

experiment put it:

> Land-use changes are taking place very fast in this region. In some cases it will
> be hard to study the forest before it disappears. There are also very large impacts
> [associated with] the phosphorous and nitrogen that [local agro-industrial
> enterprises] add to the landscape. In the short term these changes will make it
> harder to carry out our research.

The site at which the experiment stood, and Amazonia at large, was seen as

creating a contingent configuration whose most important attributes were accessible

only in precarious forms. Scientists were preparing themselves to continue their work

while factors such as deforestation and runaway agrochemicals collapsed the ecological

orders they were just beginning to understand. This kind of work offered a picture of the

planet as a mosaic of trembling ecological orders that could be compared by virtue of

their relative fragility. My interviewee added that Amazonia, although undergoing

profound changes, was not as fragile as boreal forests in which small changes in

temperature were apparently leading to a demographic explosion of insect larvae. Such

insects were capable of undermining tree health which could lead to killing, in my

interviewee's words, "millions of trees as fires run amok." In Amazonia things were

moving a bit more slowly. He added that:

> something similar [to the collapse of boreal forests] may start to take place
> [here] only in about 10 years. At the earliest. And in any case, I would not say
> that such changes would stop my research. Quite the contrary, there would be
> more elements that we should then try to understand [and more research to be
> done on] the new processes that would take place.

Like several other scientists I interviewed, Margaret's colleague emphasized that

the end of known worlds would offer an ever-growing range of "elements" and "processes" that could *further* scientific research. Such an approach was remarkably different from "silent spring" studies wherein ecological crises were described as the progressive dimming out and silencing of the world. To be sure, the sites at which my interlocutors worked had seen the deaths of insects and animals that a short while ago filled forests with sounds that today are no longer heard. Monocrops were also monotonous landscapes that contrasted with the visual richness of the forests they replaced. However, the team's singular engagement with loss enabled them to focus on latent entities and relations that were brought to the senses by human geologies in violet flux. Although there was little doubt that troubling times lay ahead, scientists stressed that the entities that composed the forest were already responding in rather creative ways (showing "resilience" and "adaptive" capabilities). While potential catastrophes in the making brought to the senses non-human entities and offered novel opportunities for scientific research, some of the most powerful forces beyond ongoing environmental change contributed to shifting environmental politics away from efforts to "save the forest" and towards contributing to environmentally ravaging experiments.

Experimental REDD+ Policies

My interlocutors' approach to environmental management strongly echoes the insights of Fabian Muniesa and Michel Callon regarding the political potential of *in vivo* experimentation. Callon and Muniesa argue that experiments are more than a way to learn about the world: they are practices by which new worlds are "provoked" (Muniesa and Callon 2007). According to them, the kinds of worlds that may be

provoked via experiments will vary depending on the architectonic arrangement in which the provocation takes place. They describe three ideal architectures (and therefore three kinds of provocations): the "laboratory," the "platform," and the "*in vivo* experiment." The "laboratories," Muniesa and Callon argue, are spaces that presuppose a clear-cut separation between an "interior" and an "exterior": in the interior of the lab experts come up with solutions to predefined problems which are then sent outside for implementation (*idem*: 170-173). A good example of "laboratory" initiatives are expert plans to "save" Amazonia by creating natural parks and other hermetic spaces which are commonly designed by experts and then offered to (or imposed on) non-experts. These initiatives are based on representative aesthetics and presuppose a degree of expert alienation and vertical imposition of expert plans.

The "platform," on the other hand, brings into question the "inside" and "outside" of the lab as it opens policy spaces to the contributions of non-experts. Platforms are seen to favor "research in the wild" (Callon, 2003) wherein broad publics have a say in the problems and objectives that define science/policy experiments (Muniesa and Callon, 2007: 173–174). The experiment I visited had functioned as a "platform" at some points in its recent history. For example, it once housed a greenhouse that was part of a project that bought native seeds from populations living in a protected area nearby. The project used the seeds to grow stalks that were given to farmers in the vicinity so they could establish private forest reserves. The lab was therefore part of an effort to put in movement a flow of vegetation and cash that blurred the boundaries between economic, scientific, and conservation spaces.

Finally, the "*in vivo* experiment" as defined by Muniesa and Callon opens the

platform and radically abolishes the distinction between the "inside" and the "outside."
The list of participants in an *in vivo* experiment is not defined in anticipation—one of
the *in vivo* experiment's objectives is to render explicit new participants and bring them
within the experimentation collective (*ibid*.: 178–179). Another way to put this is to say
that the background conditions of in *in vivo* experiments are initially undermined and
then constantly labored upon. In this kind of practice fundamental changes are expected
to take place regarding the composition of the set of participating entities as in the type
of relations that are possible among them.

The main policy to which Margaret's towers were expected to contribute was an
in vivo experiment: a REDD+ initiative characterized by supporters as "the biggest
experiment in tropical conservation history" (Tollerson 2009) and defined by its critics
as "the world's largest experiment" in payments for environmental services (Corbera
2012). The REDD+ initiative at this location was unlike the one I described in chapters
one and two—in which I described programs that dealt with poor peasants to whom
carbon trading schemes were expected to provide tools with which to compete in an
expanding ranching economy. In this forest–savanna transition area the planned
REDD+ program was expected to contribute to agro-industrial operations as these
transformed themselves in order to compete on rural commodity markets. As I
explained in the previous section, massive agro-industrial farms around the open-air
laboratory (some extending tens of thousands of acres) were engaged in continuous
experimentation with a range of technologies and techniques. Margaret's towers, some
of which stood in agro-industrial fields, would offer farmers a precise assessment of
variations in greenhouse gas emissions resulting from using various technologies and

inputs. Based on this information scientists and farmers would be able to identify

relatively "low-emission" practices and use this information in a certification program

that would reward "low-emission" producers. The certification could make it possible

for landholders to access environmentally aware markets and earn a premium on their

certified commodities that could allow them to offset the costs of more expensive

agricultural technologies and methods (Figure 46). Over the long term, Margaret's

towers could be used to sell carbon credits. Long-term information on agricultural

practices would allow farmers and scientists to demonstrate that the dissemination of

"low-emission" practices represented a reduction in "business as usual" carbon

emissions that should be rewarded with carbon credits.

Figure 46. Agro-industrial operations adjacent to the open-air experiment. Trucks download agro-industrial inputs in an operation that could be part of a future REDD+ scheme.

This approach is designed to work on the basis of never-ending scientific and

economic experiments that transform how participants sense and engage with the world.

Producers are expected to start accounting for the large-scale ecological impacts of their practices. Scientists in turn should recognize the economic impacts of their environmental management proposals. Both scientists and producers are expected to broaden their understanding of unfolding ecological crises and consider environmental management and capitalist production in tandem. Scientists and producers are also expected to begin sensing unfolding environmental disruptions as a horizon that, however troubling, offers new possibilities for research, profit, and political alliances. In other words, under this model experts and producers would engage in scientific/agro-industrial experiments with the hope of generating new modes of farming, new commodity shipments, and new levels of atmospheric pollution and nutrient runoffs—in short, to provoke new, melting worlds.

REDD+ and the Aesthetics of Exposure

This experimental approach to forests/agricultural management offers an enlightening counterpoint to REDD+ projects advanced in other latitudes that rely on an aesthetics of simplification, standardization, commensuration, and invisibilization (Gupta et al., 2012; *see* also: Boyd, 2010; Lövbrand, 2009; Thompson et al., 2011). This literature has demonstrated how some REDD+ projects belong to a techno-managerial tradition in which complex and heterogeneous worlds are simplified and rendered "legible" through expert projects that promise mastery over Nature (Lövbrand, Stripple et al. 2009, Boyd 2010, Thompson, Baruah et al. 2011, Gupta, Lövbrand et al. 2012). In those terms, REDD+ is understood to require the construction of "calculatory spaces" wherein technology "discloses the world to us as an object of orderability" (Lansing

2012; 2010: 712). Such limited disclosure can be described as a "closure of disclosure" (Stephan 2012: 626) insofar as it would occlude vibrant and fluid worlds and render invisible the possibility of effecting radical socioeconomic changes.

Although such criticisms convey an aesthetics that predominates in some techno-managerial environmental management approaches, I argue that not all forest carbon market schemes may be productively analyzed in such a way. The REDD+ initiatives I studied were advanced by scientists who did not turn a blind eye to violent and complex socio-natural relations. Similarly, my interlocutors' plans to help certify "low-emission" agro-industrial operations were never expected to reveal an ideologically self-consistent and beautiful Nature. Neither did these initiatives blind my interlocutors to the limits and contradictions of their environmental management proposals. This was clearly expressed by a young scientist assigned to work with data from Margaret's towers and whom I asked whether the environmental policies his team supported could avert future ecological crises. He offered a negative response:

> Even if we stop [agro-industrial operations] we would have, in the long term, the effects of [the environmental disruptions] we have already caused. So to think we can avoid [ecological crises] is utopian. We cannot. I think we cannot. [pause] We have previsions that there are some actions that seem to be more effective, that seem to have a certain effect, a reasonable effect, in reducing some aspects of such crises. Therefore, these tools should be prioritized and have continuity in order to secure this process.

My interviewee's suspicion of utopian scenarios and his understanding that there was nothing we could now do to arrest unfolding and intensifying crises was widely shared by my other interlocutors. Without exception, the members of the science team

explained that REDD+, "low-emission" agriculture, and other environmental

management schemes they supported were analogous to their research projects: they

engaged with socio-natural ecosystems in flux whose orderings were disappearing to

become something radically new. Here again my interlocutor's work can be seen to

convey the aesthetics of exposure. We see this, first, in the modesty of his stated goals:

"to have a *certain* effect, a *reasonable* effect in reducing *some aspects* of such crises."

Far from trying to reveal Amazonia as a space of orderability, passively awaiting the

sculpting hands of scientists that should be endowed with powers that supersede the

ordinary competencies of humans and non-humans, my interlocutors brought to the

senses purportedly uncontrollable socio-natural unravelings. Moreover, they worked

alongside powerful agricultural corporations and placed themselves in a subordinate

position in relation to incalculable socio-natural shifts and powerful economic interests.

Another aspect of the aesthetics of exposure was present in my interlocutor's

explanation that appropriate plans to engage with changing Amazonian ecologies

should not be utopian and that a "reasonable" approach would recognize disruptive

socio-techno-economic landscapes as the unavoidable conditions of environmental

work. For my interlocutors, environmental crises were acceptable and within the realm

of what could be imagined, sensed, and endured.

The science/policy work at the open-air laboratory not only proceeded at odds

with critiques of REDD+ as a representational type of political aesthetics but also

qualified in important ways Latour's optimistic interpretation of environmental

aesthetics. In a recent allusion to his Amazonian fieldwork, Latour argued that

"citizens" and "scientists" today are both in the position of earthworms—in the sense that they cannot see Nature as a harmonious whole. Immersed in shifting socio-natural worlds, experts and non-experts are, according to Latour, challenged to witness realities that stand as an "assemblage of contradictory entities that have to be composed together" (Latour 2011). Latour argues that it would be desirable for collectives to learn to enjoy the contradictory sight of networked worlds, forego their taste for designs that promise orders capable of preserving things as they are, and see the dissonance that always reverberates through plans to bring the planet into complete, self-contained configurations. The assumption underlying this line of reasoning is that cultivating an interest in "ugly" worlds would lead to enhancing "the coherence and continuity" of an "interior world" (Latour 1995[1993]). In other words, Latour claims that by seeking a total interiority under expert rule, groups and persons expose themselves to socio-environmental crises. Inversely, by exposing groups and persons to radical transformations, a more encompassing inside may be built.

I claim that my ethnographic analysis of policy-oriented open-air experiments in Amazonia brings to the foreground various points at which Latour's assumptions turn problematic. In the next section, I show that scientists who used the outcomes of their open-air experiments to build REDD+ proposals sensed the Anthropocene worlds they inhabited as exteriors that are indifferent to humanity. I also show that this sense perception goes together with scientific self-perceptions of humans as strange beings capable of aesthetic enjoyment while witnessing the disappearance of that for which they care.

Three

Wilderness Without Nature

The region in which the open-air experiment was carried out, teeming with economic and scientific experiments and undergoing macro-ecological shifts, was a place from which the planet seemed indifferent to human, cognitive or aesthetic capacities. When someone like Rondon (an enlightened, positivistic, modern statesman) engaged with Nature as "wild," he did so in a way that minimized the weirdness of the exteriors he faced. He might have experienced his expedition under duress in far away lands but he saw the outsides in which he lived as being made out of mechanical relations that were available to humans seeking to claim a home within them. For him as for most Western-minded persons, Nature's outside always pre-figures a total human inside. When invariable laws are revealed, humans will be able to call the planet home and orchestrate the marriage of Culture and Nature. Wilderness for Rondon was therefore not all that "wild," as it passively waited for human eyes to reveal its secrets and human hands to realize its inner order.

Radical "wilderness," in contrast, can be seen in monocrop plantations of domesticated and engineered plant species, in the unsettlingly hot atmospheres of plantations and pastures, in shifting rain regimes and frequent droughts and intensifying fires. These elements did not compose realities whose entangled hybridity stood unruly, unhinged from human dispositions, unavailable to human mastery. These fluxing volumes of matter offered bewildering challenges to the scientists and farmers who worked at these sites advancing never-ending experiments. They made it impossible to conceive of a total order (economic or ecological) and made it necessary for humans to

entertain the idea that not everyone (perhaps even most humans and non-humans) could have a place on earth. Only through struggle, cunning strategies, and endurance could scientists hope to make an impact on local practices and global politics; only in this way could farmers hope to take part in global commodity markets. Wilderness (in the sense that I began developing in the previous chapter and that I elaborate here) alludes to thick, non-human as well as human-wrought volumes of matter whose shifting forms and animated ways preclude engaging with it as an absolute background wherein humanity can settle down.

Lévi-Strauss feared the advent of a world of monocrops in which all *pansée sauvage* (wild pansies *and* savage minds) would have been uprooted, tamed. Such a world would be one in which de-sedimentation would have created landscapes barren in their homogeneity—mere dunes shaped by the automaticity of entropy. Although in retrospect he was quite right to emphasize the importance of monocrops, human geology, and de-sedimentation in central Brazil, he was wrong to equate entropy with automatic collapse—and wrong as well to define entropology as the disappearance of the human in automatic processes. His thermodynamic assumption was that the entropic remaking of the world (the dissolution of boundaries and familiar forms by forces that created inhospitable conditions for humanity) ran against the current of human creativity. More precisely, monocrops undermined what Lévi-Strauss understood to be the characteristically human aesthetic disposition: the capacity of the *bricoleur* to de-totalize the world, categorize its component parts, and re-totalize them in symbolically meaningful and stable cultural orders. How could aesthetic fruition come from something other than the completion of a self-consistent oeuvre? Latour's non-

representational and non-naturalist ethnography makes it possible to answer Lévi-Strauss's implicit question.

At the open-air experiment we observed scientists engaging with agro-industrial processes that destabilized even the most basic categorization of Amazonia as a tropical forest. Their intimate, sensory engagements with the history of the region's de-sedimentation did not lead to re-totalization efforts and projects that would effect a well-formed layout. And yet the immersion in continuous de-totalization was a highly creative undertaking. Scientists and farmers were not carried away by impersonal forces but completed radical innovations contributing to nothing less than bringing new worlds into existence. In these terms, it is wrong to define entropology as the study of the end of the human as it dissolves into an endless outside. Entropology can best be understood as the examination of a singular capacity some human animals exhibit to endure the aesthetic work that goes into the contemplation of human geologies that are indifferent to humanity.

Researchers in the Wild

In Amazonia, when wilderness is dissociated from Nature (the invariable background that allows experts to claim unrivaled access to truth), democratic efforts mix in puzzling ways with potentially self-destructive projects. Michel Callon and Vololona Rabeharisoa defined "research in the wild" as a type of research enterprise in which non-experts play leading roles in defining research questions, determining laboratory agendas, and putting together research programs (Callon and Rabeharisoa 2003, Latour 2004[1999]). The example they use is that of a group of people in France

who joined forces to successfully advocate for research on unattended biomedical problems that were of particular interest to them. Researchers in the wild, from this viewpoint, open scientific practice to non-expert concerns and establish links of care and solidarity among scientists and broader publics. Although their European, biomedical case is rather different from climate politics in Brazil, it sheds light on the relations I observed between the scientists who worked on the experiment I visited and the farmers who carried out agro-industrial experiments around them.

The scientists with whom I worked not only studied the ecological impacts of agro-industrial farms, they were also willing to work within ecological schemes that, like agro-industrial certification systems, did virtually nothing to alleviate severe ecological impacts such as agrochemical runoffs—whose impacts scientists knew could lead to the "disappearance" of the forests they studied and cared for. Their science/policy stance received harsh critiques from environmentalists who were less prone to form alliances with large farmers. My interlocutors, however, remained firmly committed to their strategies and emphasized that their controversial approach was needed to renounce elitist techno-managerial schemes wherein scientists were placed in command of peoples and territories. One of the scientists who argued for that position was Carlos, a senior researcher who worked in the LBA and had published numerous influential studies on the Anthropocene and macro-ecological changes in Amazonia. I asked him whether it was frustrating to see his scientific advice ignored by political and economic forces that continued to push for the expansion of ranching and agriculture in Amazonia. He forcefully replied,

No! It is not depressing nor frustrating [laughing out loud]. It is simply the way society works! When you say it is frustrating, it is because you want to ignore the sociopolitical and social functioning of our planet. This is the mistake in your thinking. Science does not drive the planet and it should not do so. Science is just one of the aspects, and not the most important one. People need to eat, they need to move, they need to have a minimum living standard.

For Carlos, the "functioning of our planet" was not determined by abstract laws or mechanical causation involving inert Natural entities. He understood the earth as an unstable aggregate of processes the most important of which (mass consumption and global food production systems) fell into different categories from those of the objects scientists could hope to understand completely or over which they could hope to rule. As he rightly put it, when asking my question regarding frustration in the face of such worlds, I mistakenly assumed that he would long for an ideal, nonexistent world in which he could ignore the "sociopolitical and social" forces that composed the earth— as if being a scientist would make him a narcissist who would spend his days dreaming of easily readable and controllable absolutes. From his viewpoint, feeling excessive disgust in the face of the unravelling ecological crises that his research vividly documented entailed an unacceptable elitism. What some environmentalists saw as ecological catastrophe he saw as novel opportunities presented to poor populations by the accelerating circulation of rural commodities and the expansion of mass consumption infrastructures. "People need to move," he claimed, echoing the peasants about whom I write in the previous chapter and for which movement elicited profound, highly ambivalent desires. Carlos recognized that trembling worlds in flux offered a chance to the poorest. How could I, Carlos seemed to ask me, think he could feel frustrated about seeing people strive for their dreams of a good life? Why would I assume he was driven by a rather vulgar taste for totalizing compositions? It was a

matter of both justice and scientific rigor, Carlos explained to me, *not* to denounce unfolding environmental crises but instead to find a way to operate within them. His job as a policy-oriented scientist was therefore a complicated one, to make sense of environmental disruptions but do so in ways that would not generate the kind of repulsion that could lead to elitist responses.

Carlos worked to strike such a balance without embracing the naïve idea that an environmental approach that was open to the need for movement could bring about a more harmonious world. For him, to remain attentive to the political necessity of movement did not mean blind faith in a future in which the earth would become a comprehensive socio-environmental oeuvre that would harmoniously include humans, trees, and monstrous socio-natural processes. Human-driven disruptions, he thought, were already bringing dire futures. "Life will be much harder on our planet 50–100 years from now," he told me, due to "a decision taken by our generation and three generations before us—to increase greenhouse gas concentrations in the atmosphere in order to achieve economic growth."

Carrying research "in the wild" here means working immersed in the movement that renders concern for others inconsistent at best and often self-defeating. Finding movement repulsive by virtue of its ecological outcomes betrayed the struggles of some of the poorest populations and was not acceptable for a scientist like Carlos. At the same time, ecological approaches compatible with the movement that was ambivalently desired by poor populations likewise betrayed these same populations—insofar as de-stratification placed the poorest in precarious situations. In movement, genuine social and political commitments and self-destructive stances could not be disentangled.

The Anthropocene not only offers freedom from dominant classificatory orders and expert systems of authority, it also confronts scientists with radically wild and monstrous situations. Carlos saw industrial human geologies (the materiality of global food production systems and mass consumption infrastructures) as short-circuiting feelings of care and solidarity. Wilderness was not a non-human expanse awaiting domestication, nor a felicitous encounter between experts and non-experts freed from reactionary orders. Wilderness was wild because it rendered commitments to justice incompatible with desirable outcomes. It turned efforts to build inhabitable insides into conditions that would lead to a harder life. This unnatural wilderness was related to the aesthetics of shock.

In an argument in which he defined climate politics as a kind of research in the wild, Callon claimed that one of the strengths of carbon markets was that they transformed the sense of *shock* elicited by planetary crises into a network of less intractable problems (Callon 2009). Callon, whose argument is based on the kind of politics scientists like Carlos actively championed, argues that carbon markets are politically significant because they resist framings of global warming in scientific terms alone—as a single problem that deserves a single and absolute response defined in experts' terms. Rather, carbon markets remain in the wild, they break intractable climate problems into smaller, more manageable questions posed by non-experts that non-scientists are also called to answer. Callon writes:

> How can we scientifically evaluate, and thereby economically value, the effects in terms of greenhouse gas abatement of replanting a forest in a rural area of Brazil? Driven by attempts to make this protean issue of climate change manipulable and manageable, formulations of problems proliferate and react to

one another. *Instead of a shock, trauma or complex issue*, a dense network of problems appears. (Callon, 2009: 544, emphasis added)

Callon invites us to imagine a policy that works by presenting reforestation in Brazil as a strategy for limiting greenhouse gas concentrations. Such proposals (rather similar to those advanced by my interlocutors) are important, according to Callon, in their effectiveness. For example, if in agro-industrial Amazonia a scientist were to ask farmers to demand reductions in their emissions to meet globally defined quotas, she would find insurmountable resistance from groups that reject her framing of the problem. Carbon markets de-totalize the climate problem into smaller questions that can be resolved in local terms. So in our example the scientists would ask how she can help farmers increase yields and compete in global commodity markets using the tools of green capitalism. In the latter formulation, scientists respond to the shock of planetary crises not by seeking comfort and control but by stepping into the wild and establishing relations with non-experts who offer their own framings of smaller-scale problems.

Pursuing climate politics successfully, Callon suggests, requires enduring the shocking sense that only massive and absolute policies may avoid the collapse of total orders. In Callon's assessment, as scientists step into the wild, shock recedes and disappears into networks of problems that gradually bring glimmers of hope into appalling situations. Callon's normative and ungrounded assumption (that a foray into the wilderness of the Anthropocene somehow happily leads to familiar situations) is undermined by the views of scientists who carry out the line of work he uses to exemplify key parts of his argument. For them, the shock that comes with contemplating the wild short-circuiting of care and solidarity pervades de-totalizing climate politics and makes life-long policy/science projects that force experts to accept

the sensory experience of loss and disappearance.

Accepting Exposure

Johanna, a senior scientist who has played a very active part in open-air experiments in forest–savanna transition areas, described to me how her decades-long contributions to open-air experiments and her more recent advocacy of REDD+ were inseparable from efforts to make sense of bewildering circumstances. "I will be 90 in 50 years" she told me, and

> by then we will live in a totally different world. [Sighs] If only [my husband and I] were independently wealthy and I could travel around the world to see these places before they don't exist anymore. But we are not. Although sometimes I sneak out of conferences and go 'Hey look! I saw an orangutan'—even if it was not actually in its forest . . .

The pessimism resonating in her prognosis (significant in itself due to the central role she played in promoting REDD+ and other global climate politics) was accompanied by desires to witness places that are on the verge of disappearance and seeing species on the edge of extinction. Johanna's science/policy work was informed by shocking awareness, by the "fright" of living on a planet that would soon be thoroughly unfamiliar and in which, even now, some things were recognizable only as fading traces of what would soon be no more (like an orangutan in a zoo). "I am sad because we are going to keep losing languages and cultures, and also plants, and, and . . ." Johanna said, finding her argument with the help of pauses and fillers:

> But it's much more frightening to think that we are actually going to change our atmosphere more than we can change it back. And I, I . . . At some point I don't care if we do not have a primary forest again as long as there is something there—maintaining the atmosphere and maintaining the hydrological functions. I know that a monolithic, secondary forest is not what we want and will

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probably bring its own problems. But I would much rather see something there . . . than nothing.

Johanna's musings about an artificial ecological concoction that could eventually take the place of forests lost to the quake of feedback processes may seem like an environmental version of the juridical–military logics of the "lesser evil" and the state of exception. Such logics are premised on the idea that, under emergency situations, states of exception may be declared wherein the law may be broken by state agents so they may preserve the background socio-institutional conditions that sustain Law (a working economy, the possibility of carrying out everyday activities without fear of death of injury, liberty of movement, etc. see Ignatieff 2005, Schmitt 2005 [1934]). As critics have demonstrated, the logic of the "lesser evil" lends a veneer of rationality to deeply reactionary projects that open unbounded spaces of illegal activity wherein secretive state organizations pursue projects beyond public discussion and oversight—projects that often effect massive death in the name of preserving life (Agamben 2005). Although the logic of the lesser evil is flexible enough to legalize ghastly, undemocratic, deadly, and irrational projects, the ultimate ideological justification of this approach remains the re-establishment of a threatened order—a future endpoint in which state institutions may cleanse themselves of the violence on which it they now stand. As Eyal Weizman has vividly shown, the lesser evil works within a Panglosian cosmos wherein even abhorrent catastrophes are interpreted as signs of an underlying cosmic order the idea of which allows persons and groups to carry on (Weizman 2011. See also Connolly 2013). The state becomes wild and the sovereign a beast all in the name of bringing a tamed cosmos into being.

This approach offers a stark contrast to Johanna's image of a monolithic

secondary forest sadly preserving some of Amazonia's hydrological cycling. Even if such a concoction was, in her words, preferable because it would be "something rather than nothing," it did not signal a hidden background whose invariance could promise the reestablishment of Natural laws under threat. There were no background environmental conditions she could hope to protect, no environmental laws whose safeguarding could legitimize the suspension of more rational ecological approaches. The problem was that the background of social life (a working and growing economy, people capable of striving to improve their living conditions, etc.) was the very cause of socio-ecological the disruption. Johanna's Amazonia belonged in he Anthropocene, a time bereft of a lawful cosmos and in which the most scientists could hope for seem to be enduring open-ended disruption. She and her colleagues had a more transparent— even tragic—relation with loss compared with that of state officials who champion for exceptional measures. At one point she called such a stance "pragmatic realism" and explained it to me in relation to her work's leaving something rather than nothing:

> That is, I think, the source of my pragmatism. And optimism. Maybe. Where I just say, okay. I am okay. I can accept this. And then [pause] It is kind of funny because I do not think of myself personally as someone who accepts loss very well. Like, oh my God! Like if I step on a bug. I go buuuuuuu [pretending to cry]. And even just saying goodbye to someone after seeing them for two days. Buuuuuu [pretending to cry]. It is horrible! But I can accept the fact that the world is changing.

Johanna's pragmatic, optimistic acceptance of "horrible" feelings of loss is much more serious than crass opportunism and entails an ontological stance. We may here consider that pragmatism can be seen as entailing a sense of the world as devoid of general principles or a stable background and in which those interested in political

action need to advance situated, contingent strategies (Massumi 2011: 29-37). Pragmatism, in other worlds, signals a non-Panglossian cosmos, which is to say, a cosmos in which catastrophes cannot be famed as a step towards a good life. Johanna did not believe her artificial forest would somehow restore Pristine Amazonia or contribute to a harmonious socio-natural composition. Pragmatically sensing a world of loss, she instead endured the bewildering self-awareness of being someone who could never shed her wolves' clothes or afford to cry at the sight of collapsing worlds.

Conclussion

Bichos of REDD+

Even if Johanna could take no refuge in the comforting idea that REDD+'s shortcomings were justified by the scheme's capacity to protect Nature's laws, one could still argue that she could justify her ecological proposals as a reflection of an inner Human Nature. As I argued in the previous chapter, some Westerners see humans as intrinsically egotistical and untamable animals whose behavior can be altered only by appealing to their narrow self-interest. REDD+ schemes could be an example of this approach insofar as their proponents do not expect landholders to cease cutting forests unless they are offered economic gains for doing so. It would be possible to interpret this system of incentives as conveying the belief that humanity's inner "wild animal" leaves us no other choice than imperfect environmental solutions. In other words, even if REDD+ does not conform to the idea of Amazonian Nature perhaps it conforms to and is justified by the idea of Human *Inner* Nature.

I discussed whether existing REDD+ proposals were based on such an understanding of the human with a senior researcher who worked very closely with Johanna and whom I asked whether his support for environmental payments meant that he agreed with João's argument "man is the nastiest animal." He listened to my explanation of João's claim and responded that "we tend to talk about human beings as earthlings, but different populations have different levels of influence in their environment." He mentioned variations in migration patterns, economic activities, and lifestyles. Therefore, he continued, it would be wrong to assume that a policy such as REDD+ was designed to appeal to humans who have an "inner human directionality

towards destruction":

> I once saw in a large conference on REDD+ an indigenous person who went to the front of a panel and put his finger to the face of three famous environmentalists and told them. You want to teach us how to keep the forest standing? With money? Our population has kept the forest standing without money, without anything, and we know how to take care of it much better than you do. What you want is to destroy all the forest that we have.

All the scientists I met shared anecdotes or comments similar to this one. They were all keenly aware of the problems and dangers of implementing a system of environmental payments. They were particularly concerned with the possible effects such schemes could have in indigenous communities whose livelihoods they saw as radically different from their own. In sum, they strongly disagreed with the racist premise that once you shake off their "paint and feathers" indigenous persons unveil a hidden Euro-American individual. Scientists promoted mechanisms for valuing trees in terms of money without trying to appeal to a *shared Human Nature.* Rather, they responded to the sense that they faced a *common human exposure*. Scientists like Johanna lived in a morass of ambivalent desires and sensed themselves to be affected by entities similar to those pushing poor populations towards environmentally destructive lifestyles. This is how one of the most important contributors to REDD+ proposals at the UN put it to me:

> In relation to global market forces there is at this juncture no going back . . . we may not be capable of transforming capitalism wholesale into something much more benevolent than it is.

His speech slows. He looks down at the floor struggling to articulate words that seem to escape him:

> But [pause] but can we find ways [pause] to allow the power of markets to

[pause] to work for [pause] for forest protection, emissions reductions, and also for the [pause] for forest peoples? It is difficult to say, to see a good outcome [the market] is too large, too powerful and the market, the market is very compelling, ask my friend . . .

He points with his head to the wall behind me. There he had hung a picture of an indigenous man with whom he had established a close and lasting relationship during his extended fieldwork in Amazonia:

he lives in town and he sees a bunch of stuff that he thinks is great. And he is not alone, he is all of us really. At one level [the market] is nothing but the materialization of our desires. But it is too powerful. Some draconian regulation is not just going to stop it. And it is not going to be stopped. So the whole idea of REDD+ is how can you come to a market-based solution that is actually going to work for the environment and for the people that it needs to work for?

In the following chapter I have more to say about this sense of inhabiting worlds in which irresistibly powerful markets forces roam—as if they were debased demi-gods. For the time being, let me just emphasize that the de-totalization of climate politics into smaller economic problems was perceived by those who designed and proposed REDD+ as adapting ecological approaches to unnaturally wild capitalist markets. Callon and Latour assumed that forays into the open would allow humans to expose themselves to a richly animated world whose distributed creativity would shelter them in an extended interiority. Such an approach has nothing to say about world-renowned climate policy practitioners' sensing the power of animated entities such as capitalist markets or mass consumption infrastructures that cunningly, forcefully, violently, lead experiment participants to radical exteriors.

It was particularly unsettling for REDD+ proponents like Johanna that when their critics accused them of naïvely seeking cosmic harmony by representing trees in monetary terms they missed the more important aspects of their work. "It's not about

the money," she claimed, it's about "making connections" and working together with powerful political and economic interests and thinking about the long-term relationships between economic enterprises and ecological objectives. "I get so irritated with these [critics who say,] you know, 'meeee don't put market value on the trees,'" Johanna confided:

> If I could also spend my days wandering around forests looking around I would like to do that. Right? But you can't be a person who *opens her eyes and looks at what is happening in the world* and then say that [just wandering around forests] is an okay way to spend my life, you know? I like, don't think so. I don't want to turn around when I am 85 and I may have been completely unsuccessful, you know, in my career. But I feel at least I would have struggled, and that, maybe that is worth something . . .

Johanna knew that by the time she reached 85 or 90 the world would be thoroughly foreign and it was possible she would look back to ecologies that would prove her to have been "completely unsuccessful." Such an unhomely world was not an abstract possibility but stood announced by the lack of tranquil forests in which she could aimlessly wonder. She explained that in the context of global demographic growth and the possibility of global food crises her main concern was not trees. She was building relations with Brazilian agricultural research institutions and agro-industrial corporations who were pushing rapid ecological and techno-economic changes not only in Amazonia but also in Africa. There was great opportunity for global climate engagements in such efforts, she claimed. And although such plans presupposed a world of monocrops that would be unavailable to dwelling, there was some aesthetic satisfaction to be had in such an industrial movement. The fruition of Johanna's ideal would have appeared strange to Lévi-Strauss as it came directly from the burning core

of entropological endeavors that foreclosed the possibility of stable systems of signification. What Johanna valued was her *struggle*. As an oeuvre in itself she struggled in an open-ended experimental field that required constant innovation. Her work did not represent anything and had no other legitimation (appealed to no other truth) than her capacity to endure.

Johanna's *struggle* captured a disposition shared by her policy-oriented colleagues. Fully aware of the insufficiency and inconsistency of their market-oriented environmental policies, they carried out these policies with no blueprint that could be thought of as conveying Nature's laws or anticipating a more beautiful cosmos. This political–aesthetic stance poses important "religious" questions. According to scholars who study the ideology of the aesthetic, aesthetic ideas and experiences of the beautiful and the sublime allude to feelings elicited by the sense perception of entities in the world coming together in meaningful composition. Think of clouds, sun, hills, and vegetation composing a sunset that, perceived as a landscape by a wonderer, may lead to questions regarding what (or who) in the world (or above it) made it possible for them to come together in such a way. The sensuous experience of non-human worlds offering a measure of order is understood to uphold the understanding that the cosmos may, despite proof to the contrary, accommodate human efforts to build a more inhabitable world. In other words, aesthetics offers sensory support to the belief that current predicaments may be transcended to enable humans to reach a higher and more perfect state of affairs.

REDD+ breaks this link between aesthetics and transcendence. Climate politics in Amazonia are not based on representational aesthetics that uphold ideas of the

beautiful or the sublime but on the aesthetics of exposure that enables persons and groups to carry on in the face of the unsightly. In what follows I focus on how such a puzzling aesthetics entails laws that premise no transcendence from the predicaments of human geology. I now turn to the acclimatization efforts of diplomats who worked in polluted atmospheres after bridges connecting them to higher orders had collapsed and, like Johanna, were left in a land of *struggle*.

CHAPTER FOUR

BREATHING EXTERIORS

> But enough! enough! I can stand it no longer. Bad air! Bad air! This
> workshop where ideals are fabricated—it seems to me to stink of
> nothing but lies
>
> Friederich Nietzsche, *On The Genealogy of Morals*, 1887

Figure 47. Plenary hall at the UNFCCC meeting in Bonn, 2013.

Introduction

I entered the massive plenary room looking for a place to sit and check my e-mail

(Figure 47). Chairs can be scarce at meetings of the United Nations Framework

Convention on Climate Change (UNFCCC) where hallways and lounges teem with

thousands (sometimes tens of thousands) of people—most of them overworked, under-

slept, and yet excited to be taking part in the world's main climate policy event. There was space in the hall, as I expected (audiences tended to be modest in there due to the usually inconsequential discussions—the actual negotiations took place in rooms closed to people who, like me, held only "observer" credentials). The audience in the room I entered, however, was captured by a frank and unusually exciting debate on the fundamentals of climate diplomacy that continued over the course of several days. "Our [UNFCCC] process is very sick," the Russian Federation's delegate, Oleg Shamanov, claimed at one point during the discussions. "We are constantly forced to resolve problems in circumstances of haste and apprehension and anxiety. This is not a healthy atmosphere."

Bad air! Bad air! And to describe the room that produced such an atmosphere, Shamanov drew analogies between climate negotiations and unfolding climate crises:

> What we now observe [at the UNFCCC] recalls . . . the collapse of glaciers. . . . The process of destruction of established principles of [diplomatic] activity does indeed recall the collapse of the ice shield in the Arctic. And I myself have seen the huge amount of ice that is breaking away . . . and how the glaciers are melting, are thawing. But does it not seem to you that [the UNFCCC] process is melting, is thawing?

I explain below why Shamanov's intervention was not intended, as it were, to clear the air or to achieve a more substantial form of climate politics that would be capable of arresting the reduction of the polar ice caps. What he argued for was a less "emotional" response to the UNFCCC's polluted atmospheres and a more "civilized" engagement with potentially catastrophic climate change. But before I present Shamanov's case and explain what it tells us about the success of REDD+ proposals at

the UN, let me first explain my approach to climate change diplomacy and how it differs from important critiques of global environmentalism.

We might start an examination of Shamanov's argument with his use of the image of melting glaciers as a metaphor for a failing UNFCCC process. This argument could be taken as an example of a radical gap or contradiction between climate diplomacy forums and climate change "itself." After all, UNFCCC's discourses and plans have not only failed to engage in meaningful ways with ecological crises but, as critics have demonstrated, they have allowed audiences to disavow mounting evidence that radical actions are needed in order to avoid potentially catastrophic futures. From this vantage point, the atmosphere at that plenary room in the 2013 UNFCCC meeting in Bonn was but the result of a parade of empty gestures, a "spectacle" or "simulacrum" (Igoe 2010, Blühdorn 2011, Kenis and Lievens 2014).

We must note such representational critiques if we are to understand claims made by some climate diplomats and scholars that the environmental policies that are currently in place are a step in the direction of effective "fixes" of global ecological problems. Nonetheless, the problem with focusing on such celebratory arguments is that they are limited to media-oriented interventions or militant pockets of capitalist ideologues. The agenda and tone of the actual negotiations was radically different during my research. Consider for example that while in the 1990s the main theme of climate negotiations was "mitigation," in the 2000s the theme was "adaptation," and today it is "loss and damage." Even the more skilled spin doctors at the UNFCCC are unable to present dominant global environmental politics as meaningful efforts. As environmentalism veers into damage control, cynical transparency rather than

ideological disguise or ideological zealotry dominates climate diplomacy debates. The

situation is, I argue, ripe for an alternative, non-representational critique.

In 1994, Annelise Riles embarked in a non-representational ethnographic study

of NGOs that took part in the 1995 United Nation's Fourth World Conference on

Women (Riles 2000). The resulting book, *The Network Inside-Out*, showed that a novel

global legal framework for women's rights emerged through a chain of practices and

bureaucratic artifacts. She showed that international law was not the product of

consensus over doctrine or content nor was it the outcome of diplomats' sharing a single

normative idea or image. Global legal outcomes were instead produced through the

weaving together of documents, people, images, and information that progressively

linked persons and institutions across the globe. Rather than expressing transcendental

principles, international law emerged from situated acts of "patterning," a networked

chaining of words, computer files, and data carried out by people guided by an aesthetic

"sense of appropriateness." Diplomats did not write texts reflecting a norm or principle.

They drafted documents following the sense that some bureaucratic artifacts should be

created in certain ways so they could become part of the pattern of international law

(Riles 2000).

Methodologically, a non-representational study of bureaucratic patterns

translates into a form of ethnography that is unlike that of anthropologists whose work

focuses on an "outside" "on and against which to work" (Riles 2001: 2). The

bureaucratic patterns Riles examines do not refer to an alternative "culture" "out there"

but are studied as composed by practices and artifacts that are found within the

academic spheres—"inside" of which we advance our careers. Riles's ethnography is designed to transform this shared sense of an inside of bureaucratic patterns into an object to be explored (as if the inside in which she found herself could be made into an object without loosing its enfolding qualities). Her ethnography thus engaged a *network* from the *inside out*.

Riles's non-representational study of bureaucratic insides in international law echoes the interest of diplomats like Shamanov in the atmospheres of climate change diplomacy. Take, as an additional example among many possible others, the opening plenary session of the 2013 Conference of the Parties (COP) to the UNFCCC. Christiana Figueres, the UNFCCC's president, then argued that diplomats in the room gathered "under the weight of many sobering realities." She then proceeded to describe two such realities, the first of which, she argued,

> we experience everyday and do not notice. Please take a deep breath . . . as you do, be aware that we are the first human beings to ever breathe air with 400 parts per million of CO_2. . . . The second sobering reality is the devastating impact of Haiyan, one of the most powerful typhoons that has ever made landfall.

A number and a typhoon, then, to make explicit the heavy atmospheres of climate change diplomacy. The number, 400 carbon dioxide particles per million (400 ppm), is a good rubric with which to assess the airs of climate change diplomacy. Scientists estimate that in pre-industrial times 280 out of one million atmospheric particles were carbon dioxide. When systematic measurements of the atmosphere's chemical composition started in the mid twentieth century, carbon dioxide

concentrations had risen to about 300 ppm. In 2013, as the symbolic threshold of 400 ppm was breached, it became easier to grapple with the idea that the last time an atmosphere of such carboniferous qualities wrapped the planet was between 800,000 and 20 million years ago—before modern humans roamed the earth. This air, as far as carbon concentrations went, belonged to a world without us, to a cosmos profoundly foreign to us. Figueres's comments begged the question of what kind of exteriors these diplomats, breathers of unhomely atmospheres, were shaping at the UNFCCC.

Figueires's comments clarify the non-representative tenor of international environmental law. On the one hand, we have the content of her remarks based on scientific forms of knowledge that concern air, the quintessential unrepresentable thing (Choy 2011, Sloterdijk 2011[2003]). More significant for the purposes of this dissertation, however, are the multiple practices and flows of data and artifacts (what Riles studies as patterns) that made it possible for Figueres to make explicit UNFCCC atmospheres. The number 400 ppm was meaningful thanks to a chain of field experiments that had meticulously gathered atmospheric air samples since the mid-twentieth century and studied carbon emissions as a "large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future" (Revelle and Hans 1957: 19). Over decades, these readings were analyzed under the light of biogeochemical studies and field experiments on ocean–atmosphere and ocean–biosphere interactions. These projects allowed scientists to assess how atmospheric carbon concentrations could be captured by oceans and plants through chains of transmutations that were creating more acidic seawater and driving behavioral changes in terrestrial vegetation. These documents flew to research spaces in which

they were combined with data on possible future human GHG carbon emissions (data based on industrial production, human demographics and lifestyle patterns). All these multiple data flows were channeled into computer models that offered continuous assessments of how this number, 400 ppm, and its anticipated, upward variation, could create a radically different earth system.

Analogously to Chauvel's soil samples and Margaret's eddy flux towers, the number connected UNFCCC's halls with trembling environments. Those who mobilized the number knew that carbon concentrations of about 350 ppm are likely to warm up the atmosphere by 1.5°C compared with pre-industrial levels. Computer simulations also show that going above 350 ppm entails irreversible and profound environmental transformations that read like an assortment of apocalyptic events (the collapse of the polar ice caps, sea-level rises, ocean acidification, biodiversity loss, accelerated extinction events, and more frequent and severe weather events such as fires, droughts, storms and hurricanes).

In 2009, such discussions informed the most important recent outcome of global environmental forums. Diplomats agreed that global environmental treaties should be designed to keep carbon dioxide concentrations below 450 ppm—a dangerously modest goal that entails temperature increases of about 2°C and sanctions violent socio-environmental changes and major extinction events as unavoidable. The benchmark that was set was frightening not only for its environmental contradictions but also because it made it easier to gauge how UNFCCC parties' voluntary GHG emission reductions fell short of the actions needed to meet even the unambitious 2° goal. At UN meetings I attended, delegates suggested that we are on our way to surpassing carbon

concentrations of about 800 ppm by the end of the century and enduring temperature

increases on the order of 4°C and higher (UNEP 2012, World Bank 2012).

Riles's study of patterning is central to the study of international law as it makes

it possible to examine how the non-representative flow of air samples, data, documents,

knowledge, and people composed chains of bureaucratic activity leading to the 2°C

target. However, contrary to what Riles's argument implies, the result of networked

practices in international environmental law formed far from a discernible "pattern" of

which it could be said that it "made sense" or that it was "appropriate." Whereas Riles

focused on patterns whose immanent forms offered a promising alternative to

international laws based on abstract principles, I show how REDD+'s bureaucratic

unpatterns emerged from the gradual, violent dismantling of environmental ideals. In

this sense, UN forums were not a place in which diplomats became familiar with an

extended interiority composed by bureaucratic artifacts, but rather constituted a

platform on which policymakers learned to breathe in sensibly polluted atmospheres

that promised violent crises to come.

I now show how REDD+ proposals were based on bureaucratic practices that

made it possible to link environmental projects in Amazonia with powerful industrial

interests while allowing Brazilian diplomats (among others) to endure working in

atmospheres heavy with environmental policy failures. My examination of REDD+ in

the UN context takes place only in the last section of this chapter. Before that, and in

order to lay the groundwork for my argument, I will first study how the history of

climate change diplomacy offers a progressive dismantling of ideals and show that

carbon markets require learning to breathe, as Shamanov put it, in institutional

atmospheres of "apprehension and anxiety."

Part One

From Miraculous to Alchemical Patterns

Anthropologist Paul Little described the 1992 UN sustainable development conference in Rio de Janeiro (Rio92) as a mass ritual (Little 1995). The largest diplomatic event to that date, the summit gathered more than a hundred heads of state and 30,000 credentialed participants who over the course of two weeks laid the foundation of contemporary global environmental law. Maurice Strong, the secretary general of Rio92, hoped this massive congregation would draft an "Earth Charter" thus distilling into a single text the more than 170 international environmental treaties then in place into a single clear law (Strong 1991). Strong thus proposed a singularly vertical patterning whereby an ascending flow of documents, scientific data and models would reach a select UN body in which experts would distill scientific and legal materials and condense them in one single text that would be sent back to the world. As a US delegate to Rio92 sarcastically put it, Strong wanted the Charter to be "taught in schools, hung in homes, memorized, and recited" (Kovar 1993: 119; Wirth 1995).

Like the print materials studied by Benedict Anderson (Anderson 1983), the Earth Charter was imagined as an artifact that would fuel secular ceremonies that would allow populations to imagine themselves as forming a planetary "we" and gradually proceed to synchronize their behavior according to universal principles (Gupta 1998). Drawing on the work of ethnographers of bureaucratic artifacts (Ferguson and Gupta 2002, Hull 2012), one could see the Rio summit as an effort to accomplish an ecologically inclined form of "bureaucratic transcendence." Strong patterning carried the promise of a sudden change that like lightening striking from the sky would overcome opposing interests and

inclinations and bring together more rational socio-ecological conditions.

Despite the momentum gathered in the run-up to Rio92 (I still remember as a kid a massive media campaign on the theme of "saving the earth"), nothing like an Earth Charter was written, not at Rio92 nor since. The reason for this was a debate with the tenor of political theology. On one side of the argument were a minority of technocratically oriented environmentalists, mostly from the Global North, who sided with Strong. They sought a way to transcend environmental predicaments through vertical bureaucratic patterns that would not only offer something similar to a "global constitution" but, by virtue of this text's normative force, would summon a global sovereign capable of taking authoritative control regarding environmental emergencies. Such a power would yield universal scientific principles to produce global juridical outcomes that could override national interests and local concerns—all in the name of the higher goal of protecting the global environment. On the opposite side of the argument were Southern delegations who perceived the Charter as a step towards the constitution of "a centralized authority for creation and enforcement of law" that could play into colonial projects to impose on poor nations demographic controls and resource management policies to the benefit of Northern peoples (Agarwal and Narain 1991, Palmer 1992, Sachs 1993). Rich nations' delegates joined the argument against Strong, although for the opposite reasons. Northern delegates feared a Charter could create a global power capable of enforcing North–South transfers of wealth and technology to the detriment of rich countries' interests (Lago 2009).

The majority of voices opposing vertical patterning prevailed at Rio92 and instead of conjuring a power capable of accomplishing "miraculous" change, the

summit's most important outcome was an institutional framework wherein delegates

hoped the "alchemical" combination of bureaucratic artifacts would lead to meaningful

eco-political results. The summit's most important outcome in climate matters was the

creation of the UNFCCC, a forum where nations would periodically meet with the

purpose of reaching agreements in order to stabilize "greenhouse gas concentrations in

the atmosphere." Not designed to revolutionize international law in a single miraculous

event, the UNFCCC was intended to serve as a forum in which diplomats would meet to

gradually weave scientific and legal documents, information, and knowledge, in

"alchemical" experimental practices. The hope was that a new, more coherent

international environmental order would gradually emerge, but not thanks to having a

single clear Charter that like a recipe book would guide the decisions of a centralized

authority. The idea was instead that delegates would engage in the alchemical

patterning involved in combining bureaucratic artifacts, people, and information

without a clear guideline or blueprint, all in the hope of eliciting immanent

transformative powers out of seemingly innocuous, open-ended chains of bureaucratic

activity (Little 1995).

Little's analysis of Rio92's failure strongly resonates with Riles's argument

that international law is "not so much a revolution of norms as a perfection of form"

(Riles 2000: 182). For example, when Riles's interlocutors wrote "sustainable

development" in the documents they produced, they were not following normative

guidelines provided by a higher authority or expressing their belief in an idea they all

had in their heads. Their interest was rather in the materials in front of them and how

the words "sustainable development" allowed them to weave themselves into

bureaucratic chains incorporating language from other documents and making it easier for future document-makers to quote from their own texts (*idem*: 72). "Sustainable development" in this context was not "meaningful," it did not accomplish juridical outcomes by referring to an object "outside" in the world nor to a belief "inside" delegate's heads. The term was, in my terms, part of alchemical patternings that remained immanent to open-ended flows of document production, bureaucratic citation, and diplomatic performance (*idem*: 81).

Unruly Procedures

The creation of a global legal environmental order was alchemical not only because its *ends* remained indeterminate but also because its *means* were similarly vague. This is to say, alchemical patterning not only presupposed foreclosing definitive endpoints (a final Text, an ultimate Power) but also entailed avoiding miraculous *procedures* that could allow "upward" fluxes of bureaucratic artifacts converging and "condensing" in a centralized body only to flow "back" in "downward" dissemination.

At the UNFCCC, particularly radical alchemical procedures were visible in the non-decision that hampered the writing and adoption of formal rules of procedure based on which voting mechanisms could allow decisions to be adopted by a majority of parties. Although various proposals for voting procedures were put forward at the first COP, these led to intractable questions: How should votes at the UNFCCC be counted? What would constitute a majority? Should China's delegation have one vote—the same as, let's say, Tuvalu? Or should votes be weighted by population, economic output, or carbon emissions? Delegations such as the United States, China, the European Union,

and India successfully opposed any voting system that could have been used to constitute a representative power whereby a majority of small nations could impose meaningful decisions upon major global powers (Grubb 1990, Keohane and Victor 2011). At stake was the capacity of nation-state delegations to foreclose pathways through which the UNFCCC could become "more" than the sum of its members and engage in dangerous acts of bureaucratic transcendence. Ultimately, no decision was taken on voting protocols and the UNFCCC adopted by default "draft rules of procedure" that are used in the United Nations system for decision-making on matters that do not require voting.

Although draft rules establish that all decisions at the UNFCCC on matters of substance should be taken by "consensus," there is no formal legal definition of what "consensus" means, thus leaving it open to the parties to determine this in practice. In the two decades of UNFCCC meetings, "consensus" has come to be defined in negative terms. Similar to "unanimity" but not quite like it, "consensus" means that the only decisions that can be adopted are those to which no formal "objections" are made by any of the parties. The "lack of objection" as a decision-making principle has repeatedly allowed the Chair of the discussions to ignore, in the midst of the argument, objections raised by one party in order to fabricate consensus. In the Cancun and Doha meetings, most famously, decisions were taken by "consensus" only after the chair of the discussions explicitly turned a blind eye to the opposition of a minority of nations. On these occasions (one of which I study in detail when I return to Shamanov's intervention) the chair of the discussions could not proceed by applying a clear recipe but had to find her way, learning in the moment, how to bend protocols and make use of

the uncharted space offered by vague "draft" rules.

The figure of the diplomat as alchemist clarifies Riles's argument that international law entails forms of power that are *not* based on meaning nor, more broadly, on relations of signification (Riles 2004: 80–84). Riles shows how diplomats are a rather different breed from technocrats whose creative powers are analogous to that of an ice-sculptor who approaches her material with a clear plan in her head and having learned all there is to know. She proceeds to apply force over an inert substance to carve a meaningful agreement between mind and matter. Technocrats would see the discarded materials, the pain inflicted by the inevitable sculpting accidents, the hardships of working out in the cold, and the imposition of their plans upon populations who oppose them, as a reasonable price to pay for the realization of a beautiful, self-consistent oeuvre. The authority of technocrats is like that of priestly spirits whose power rests on knowledge broadly understood: the capacity to understand things as they are; the ability to foresee future emergencies; the skill to intervene in, and harmonize, relations between Society and Nature; and the capacity to endure physical hardship so as to impose pre-determined plans upon the world. Such a power is "meaningful" insofar as it is premised on relations of signification (which is to say, on the infrastructural potential to materially assert a truthful correspondence between expert representations of the world as it "should be" on the one hand, and "the world itself," on the other).

The creative powers of diplomats as alchemists can be seen as analogous to a process of glacier forming (following the figure of speech offered by Shamanov). Glaciers are formed as a result of water molecules in the atmosphere that after crossing a certain climatic threshold coalesce into snowflakes that fall on the ground and

gradually crystalize due to pressure, gravity and temperature. The glacier is not a passive object shaped by external forces but the emergent outcome of self-generating dynamics. Temperature and pressure, for example, are not determined by a combination of atmospheric processes and immanent forces emerging by the coming together of masses of snow that bear creative capacities. Unlike sculpted forms that express will and creative intention, glaciers stand as the outcome of distributed creativity, conveying no reason and offering no meaning. Bearing no trace of an agreement between mind and matter, glaciers belong in animated worlds whose self-generating forms allude to shifting articulations, resonances and feedbacks.

While for technocrats the world appears as the sum of predictable chains of causation that passively transmit forces first unleashed by creative powers that transcend this world, for alchemists the world is the contingent result of immanent and bewildering forces that reside in the immediacy of material worlds. Actor network theory (ANT), cosmopolitical and Deleuzian scholars (among others) suggest that once the politics of transcendence is foregone and we allow ourselves the opportunity to recognize the distributed creativity of non-humans we will be able to build more harmonious relations with non-humans (Stengers 2010, Grosz 2011, Latour 2013). At UNFCCC forums, however, we encounter climate politics that forego rational and transcendental means and ends and become sites of alchemical experimentation. And yet the outcome are worlds in which distributed creativity is not expressed in a larger and more harmonious inside but by exposure to self-sustaining processes such as the melting and collapse of glaciers. Before I make this point by returning to Shamanov, I first explain how the Kyoto Protocol can be read as an alchemical, market-oriented

approach.

Market Atmospheres

One of the direct consequences of the absence of formal rules of procedures and voting mechanisms that could bring to life a power above national and corporate interests at UNFCCC forums was that any decision that could undermine any party's interest was rendered politically unviable. For example, while a global carbon tax is widely acknowledged as a relatively simple way to set up a normative standard that could be adjusted to reduce emissions and limit global warming (Pearce 1991, Poterba 1991), it was never implemented because national and corporate interests opposed endowing UN experts with the power to alter production activities and wealth distribution at global scales (DeCanio 2009). Taxation proposals necessarily involved vertical bureaucratic patternings: decisions would have affected UNFCCC parties unevenly and therefore required clear voting protocols so a majority of delegations could have legitimately enforced their decisions in the face of an opposing minority (Grubb 1990).

Carbon markets, on the other hand, were compatible with the UNFCCC's unruly procedures and the Kyoto Protocol sanctioned them in 1997 as the only viable global environmental policy approach. The Protocol's goal was for rich nations to reduce their emissions of six greenhouse gases to at least 5% below 1990 levels. In order to accomplish this goal the Protocol imposed a cap on major industrial operations. If these polluters emitted gases above the cap they would need to buy emission permits but if they emitted gases below the cap they could sell their emission permits so others could

use them. By using market interactions to allocate permits and guide behavioral change, diplomats avoided using a centralize directive or institution to pre-figure environmental performance for individual actors. More importantly, industrial lobbies and rich nations' diplomatic missions played a central role in the design of the most important components of the policy and the scheme effectively transmuted some of the world's largest polluters into climate policymakers (Hepburn 2007, Boyd, Corbera et al. 2008, Biermann, Pattberg et al. 2009).

As its critics pointed out, environmentally the Protocol was meaningless (in the technical sense that it did not represent a self-consistent ecological theory or pre-figured what it was or should be). Few things in it added up as it granted too many emission permits, required too few emission reductions, effectively handed out valuable resources to polluters, and did not stipulate enforcement mechanisms to apply against those who would fail to achieve their goals (Bumpus and Liverman 2008, Lovell, Bulkeley et al. 2009). While the economics of Kyoto's carbon trading schemes were highly disputable, critics added, its environmental rigor was virtually nonexistent. Kyoto went against what most scientists knew about the urgency of curbing emissions and was but an effort to turn environmentalism into a new line of capitalist business (Lohmann 2005, Lohmann 2009).

Those who were more sympathetic towards carbon markets responded to its critics by stating that, while Kyoto was clearly imperfect, its imperfections were a strength rather than a weakness. A group of ANT scholars provided particularly provocative arguments in this regard. They focused on atmospheric dynamics and expressed faith in the politics of immanence, thus echoing and clarifying essential

aspects of the logics by which carbon markets are legitimized by climate policymakers (in particular the essential idea of using markets to internalize environmental externalities). It is for these reasons that ANT arguments are worth examining in depth.

The basic assumption on which the ANT defense of carbon markets was advanced was that capitalist markets "can function, be maintained and prosper only if the environment is favorable—an environment that can best be qualified as atmospheric" (Callon 2012). The correlate of this idea was that capitalist markets may be transformed not by blowing up the foundations of capitalist operations but by working upon the atmospheric conditions in which they are immersed. Rather than seeing capitalism as an "outside" to be revolutionized by projects seeking transcendence from this world, carbon markets strived to alter capitalism's "bottom line" by working within the processes and practices of capitalist economies (Latour 2004[1999], Callon 2009, MacKenzie 2009)[56]).

Now, the atmospheric conditions of capitalism may be understood as a result of operations of *framing*, *externalizing*, and *internalizing.* According to ANT scholars, the destructive environmental consequences of capitalist operations are *not* the result of Capitalism as an out-worldly power or set of abstract logics that could be overcome only by an even higher power (Nature, Revolution, or Virtue). Rather, capitalist operations are seen as nothing but historically and geographically situated technologies, forms of knowledge and practices (conceptualized as socio-technical "agencements") that *frame* an interior space and bracket the "outer" world (Callon 1998, Çalışkan and Callon 2009). Think, for example, of Amazonian farmers who while taking part in global commodity markets devote their attention to agricultural inputs, exchange rates,

land ownership titles, and seasonal workers. The entities, relations, and knowledge that go into agro-industrial production thus become a frame of reference for farmer's actions, materially composing the atmospheres farmers inhabit—material conditions that allow them to produce and ship tons of soy while ignoring or *externalizing* the *overflows* produced by their very acts of framing: nutrient runoffs, carbon emissions, socio-economic inequality, and so on.

From this viewpoint carbon markets bring to sense experience the overflows created by capitalist frames and *internalize* these overflows as matters of concern essential to the maintenance and prosperity of markets (Callon 2009, MacKenzie 2009). In my example, scientists like Margaret (with her environmental expertise, eddy flux towers and environmental stress experiments) would combine with agro-industrial agencements rendering sensible previously disregarded elements in the atmospheres of agro-industrial operations. Carbon markets would help to acknowledge the faltering atmospheric conditions of agro-industrial farming, to *internalize* environmental factors and help farmers build novel relationships with a broader set of entities (including environmentalists, worms, soils, rains, fires, and trees).

From an ANT perspective, a carbon market's re-framing practices cannot, in principle, be meaningful, nor do they offer a depiction of what is or should be, nor do they translate a self-contained theory into a final policy proposal. Therefore, what critics perceive as the main failure of carbon markets (the lack of a comprehensive and self-content plan of action) ANT scholars argue is its main strength: the capacity to undermine stable representations (that on principle ignore overflows) and to deploy socio-technical networks capable of bringing to the senses and internalizing market

overflows.

ANT scholars exemplify carbon market justifications offered by mainstream neoliberal economics (Hawken, Lovins et al. 1999, Mackey and Sisodia 2014). As is the case with environmental economists, their strong conviction that immanent processes may effect planetary changes without transcending capitalist frameworks has little to say about how the proliferation of capitalist markets over the past few decades has led to more precarious conditions of living for both humans and non-humans (Harvey 2003, Berlant 2011, Nixon 2011, Povinelli 2011, Fletcher 2012, Connolly 2013). However, ANT scholars *do* understand the finitude and fragility of worlds composed by meshworks of human/non-human relations and reject the fanatic positing of infinite economic growth as a possible or desirable future. Moreover, for ANT scholars, non-humans are beings whose world-making capacities make them something other than resources (which are meaningful as living companions only once they are valued in monetary terms).

Due to their proximity to mainstream neoliberal environmentalism *and* to their more ambitious theoretical engagements and non-monetary sensibilities, ANT scholars clarify the cosmological stakes of carbon markets. In particular, they show how "internalizing market externalities" through carbon markets is not only a matter of abstract valuations but involves sensing, engaging with, and being aware of the volumes of matter in which market participants operate. From the perspective of ANT studies, the alchemical patterns of the Kyoto Protocol can be seen as foregoing ideas of creativity as residing in the mind of centralized power structures that can pre-figure worlds to come. When this stance is combined with the acceptance of the distributed

creativity of unfolding climate catastrophes, one of the results is, I will now show, bureaucratic "unpatterns" that challenge diplomats to breathe when exposed to the heavy atmospheres of climate change.

Part Two

Exterior Designs

Kyoto failed to reduce global GHG emissions during its first operational phase (2008–2012) and, rather than serving as a first stepping-stone towards a comprehensive global climate regime, it has had to face the recent withdrawal of Canada, Japan and Russia. Such failure, however, has *not* created a backlash against alchemic patterns or a swing of the pendulum back towards more vertical policies. Failure has instead broken the pendulum's weight free and delivered additional eco-political melt-downs (Figure 48). During my fieldwork carbon market supporters argued that the problem with Kyoto was its top-down configuration (never mind the lack of a comprehensive legal framework at the UN or the absence of rules of procedure). Even the slim juridical structure required by carbon markets was seen as too vertical.
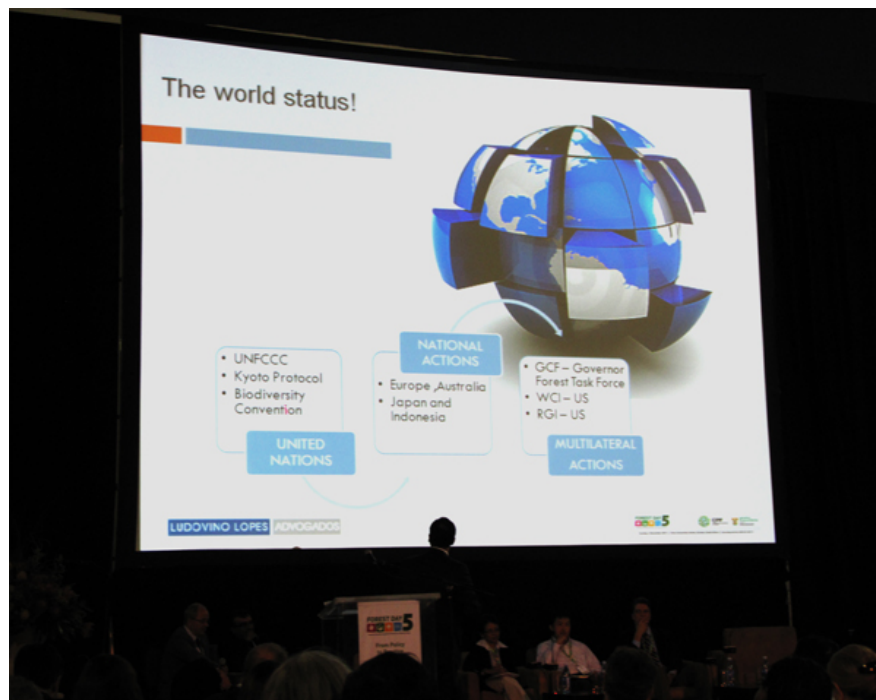

Figure 48. An analyst offers a visual depiction of international environmental law at a side-event of the UNFCCC meeting in Durban, 2011.

In parallel to these arguments some analysts, diplomats, and academics argued in quasi-celebratory fashion that the future of climate politics may not reside in plenary halls in which legal discussions would be destined to stall. Side-events and roundtables, it was said, were more promising spaces in which corporations, NGOs, and governments could present piecemeal policymaking proposals that revolved around voluntary commitments adopted by large emitters responsible for unfolding climate catastrophes (Bernstein, Betsill et al. 2010, Descheneau and Paterson 2011, Brassett, Richardson et al. 2012). Over the past two decades international environmental law has thus gone from the "miraculous" patterns associated with the Earth Charter to the open-ended "alchemical" patterns of the Kyoto protocol. More recently we have seen the emergence of "unpatterns" as climate politics turns into nothing but voluntary agreements that further empower the world's largest polluters as the ultimate outcome of climate change diplomacy. Based on the methodological framework I propose in this dissertation the entropic collapse of climate diplomacy can be seen as an outcome of creative and permanent actions that amount to something resembling an architectural work: an exterior design.

Doha 2012. Cutting the Network

For an example of exterior design let us review the debate surrounding Oleg Shamanov's intervention from which I previously quoted. "We are constantly forced to resolve problems in circumstances of haste and apprehension and anxiety" he argued. "This is not a healthy atmosphere." These remarks were made in Bonn 2013 and were intended as a description of events that took place at the 2012 UNFCCC meeting, in

Doha, Qatar. The Doha summit resulted in a series of agreements that, under the name

"Doha Gateway," saved climate change diplomacy from the brink of collapse. The

Kyoto Protocol's first commitment period ended in 2012 but in December of that year,

as parties convened in Doha, there was no agreement on how to extend the Protocol.

Negotiations were tense and at one point it was a real possibility that negotiations would

fail and diplomats would lose the only global policy mechanism in place to address

climate change. The Gateway succeeded in making minor reforms to Kyoto carbon

markets that allowed parties to agree on a second commitment period (2013–2020).

Although most viewed this as a small victory, Shamanov's remarks on the UNFCCC's

unhealthy atmosphere alluded to the particular bureaucratic patterns that the Gateway

conveyed. The Doha agreement was reached only by breaking draft rules of procedure

and summoning, for a brief moment, an authority capable of limiting the powers of

corporate players and nation states.

At the end of Kyoto's first commitment period it was clear that the lobbying

power of the large corporate players involved in the design of carbon markets had led to

over-allocation of emission permits which, combined with the 2008 financial crisis, led

to the collapse of carbon markets (Ellerman and Buchner 2008, Kossoy and Guigon

2012, Reyes 2012). Most delegations at Doha agreed to render emission allowances

from Kyoto's first commitment period (2008–2012) invalid for Kyoto's second

commitment period (2013–2020). The proposal entailed breaking open-ended market

negotiations and imposing limits that, while leaving unaffected the fundamentals of

carbon markets, would cost some of the world's largest polluters billions. The Russian

Federation opposed the argument and together with Belarus and Ukraine defended an

understanding of climate politics as an open-ended experiment carried out through

market transactions, scientific assessments, political favors, and lobbying. Discussions

between these two positions turned inconclusive and the negotiations reached the two-

week deadline without an agreement. In parallel to the stalled discussions among all

parties, a group of delegates together with lawyers from the UNFCCC secretariat

drafted a document that would extend the Kyoto Protocol without taking into

consideration objections against limiting carbon markets. They conspired to summon a

higher authority capable of overriding the opposition of a minority of nation states and

break diplomatic procedures in the name of a higher goal.

One day after the Doha round of UNFCCC's meeting was scheduled to end, the

conference president addressed the plenary burry-eyed and exhausted. He argued that

the open-ended, consensual negotiations had failed to compose a "complete text" that

could "satisfy everyone." However, he added, I "cleaned my ears very carefully" in

order to "listen to [the delegates]." This was diplomatic parlance to announce that he

intended to breach the draft rules of procedure. He was preparing to adopt the

agreement drafted by his advisors together with lawyers from the UNFCCC secretariat.

The text was *not* discussed in the plenary or agreed to by consensus and its adoption

would effectively place him and a cadre of document makers in a higher position of

authority than country delegations, effectively allowing him to ignore the objections of

Russia, Ukraine and Belarus. The "cleaning of the ears" here meant the opposite of

what it sounded like, because he intended to selectively ignore some voices in order to

reach a pre-defined endpoint.

The establishing of a higher authority that interrupted endless patterning at the

UNFCCC was achieved in two moves. The first brought together the president of the COP and the delegates through sensory tuning and silence. As there was no provision in the draft rules for breaking the rules of procedure in circumstances that would constitute an "exception," he could not muster up sufficient support for his coup through clear propositional statements. Instead, he offered a long and rambling speech in which he underlined the sense of exhaustion that pervaded the room and emphasized the fact that diplomats had seen more of one another than of their families over the last sleepless days. "You are like my children," he joked at one point. During this performance he hinted at his intention of positing himself as an authority over other parties in the room and, based on the laughter and the clapping he received in response to his rather unfunny comments, gauged whether this positioning was accepted by his audience of delegates. After intimating his intentions through the reference to exhaustion and the need to reach some conclusion, he briefly opened the floor to comments, not to bring any decision to the floor but rather to create space for any delegation who wanted to intervene.

If at that point a majority of parties would have asked for the floor seeking clarification regarding his intentions, he would have had to desist and finalize Doha without an agreed-upon text. However, only Shamanov asked for the floor and the silence of the other delegates granted the president implicit permission to overlook the electronic signal used by the delegate and turn a blind eye when he stood up trying to get the president's attention. No mutiny was mounted against the president's plans and Shamanov was left holding his country's badge in his hands, his nation's sovereign right rendered ineffectual by an effective political performance.

Figure 50. Oleg Shamanov silenced at the UNFCCC meeting in Doha, 2012. From: UNFCCC/Flickr

If the first move silenced and rendered Shamanov invisible, with the second move noise became law. When the moment came to adopt the text the president, nervous and still unsure whether his strategy would be accepted, was energized by continuous, rowdy applause. The UNFCCC's secretary sitting beside him leaned over, offering him assurance that "they are with you Mr. President, they are with you." Looking bewildered by his own intentions he exclaimed, "Sensing the will of the room to adopt this decision, it is so decided." As the gavel hit the desk the room filled with even louder applause from the delegates. Some stood up releasing through clapping the frustration accumulated over days of fruitless negotiations. Others, pleased to see the conference reach some sort of conclusion and amused at such a blatant breach of the rules of procedure, laughed out loud and shook their heads in incredulity. The atmosphere was cheerful. Amid the loud noise the president continued adopting the remaining texts, barely looking up at the audience, shyly concentrating on his notes and

often tripping over his words: "Hearing no objection I decide . . . "

In order for bureaucratic patterns to emerge out of patterning practices there needs to be a degree of closure regarding flows of documents, people, information, and the drafting and discussion of documents. This does not mean a total and final arrangement that would determine where everything goes now and forever. But there must be texts and decisions that support chains of bureaucratic activity; otherwise the result would be endless unpatterning leading to the final dispersion of diplomats who would lack even a roof underneath which they could meet. In Doha a pattern emerged although, *pace* Riles, it did so not solely by means of the textual weaving of documents according to a sense of appropriateness. The UNFCCC's president orchestrated a vertical flow of documents towards a small room in which they were combined without formal input from delegations. Decisions made in this room were then taken to the plenary and adopted through rowdy and sensory procedures that were amusing and funny as they could be could not be deemed "appropriate." Although the centralized powers generated by vertical document-making in Doha Gateway were circumscribed within a short time period, they generated a powerful backlash six months later at the 2013 UNFCCC meeting in Bonn in which unpatterns came back with a vengeance.

Bonn 2013. Airs of Civilization

Following the events in Doha, Shamanov, together with delegates from Belarus and Ukraine, demanded that delegates should be allowed to include procedural questions in the agenda of meetings of the SBI (the Subsidiary Body for the Implementation of the Kyoto Protocol—one of the two main bodies that compose the

UNFCCC). They argued that if delegates at the SBI refused to discuss who could adopt

decisions at the UNFCCC at large and under which circumstances, they would not

approve the SBI agenda and negotiations within this body would not start (the agenda

had to be adopted by consensus). Shamanov and his colleagues knew that "consensus"

was adopted as a non-decision precisely so parties could avoid procedural issues and

that turning this into an agenda item at the SBI could lead to insurmountable differences

between parties. For these reasons, other delegations opposed the proposal and when I

walked in the room four days into the negotiations the SBI agenda was yet to be

adopted.

   The depth of the disagreement became explicit when, after drawing analogies

between collapsing glaciers and collapsing climate politics, Shamanov explained why

he thought it was necessary to bring procedural issues to the forefront. Civilization, he

claimed, was at stake. "In the course of development of civilization," he argued,

> one can recall social systems where decisions were taken on the bases of
> emotions and opinions and *by the shrieking of slogans or proclamations of*
> *universal values*. That was a feature of medieval Russia, for instance . . . do
> we wish to go back to the tenth century now? (emphasis added).

   Shamanov's cynical obstructionism should be seriously considered as a

powerful form of nihilism that exemplifies the possible political extremes that could

lead to yielding the immanent powers of carbon markets to politics based on universal

ideals. From his viewpoint, Doha exemplified how parties who justified exceptional

measures in the name of higher, universal goals were only fabricating ideals that, far

from abstract, were made in particular atmospheres and rooms laden with emotions.

While some could say that the UNFCCC had taken the more rational course of action

by keeping the process alive, Shamanov pointed out that Doha had relied on non-democratic means, noise and the silencing of some voices. The plenary room had been politically significant as a chamber in which laughter and claps echoed rather than as a space that enabled the clear sharing of ideas. Shamanov thus concluded that forms of politics premised on higher goals were but a throwback to a time in which boisterous interactions, emotions and opinions formed the backbone of brutish, quasi-animalistic political life.

Shamanov's nihilistic embrace of radical immanence was extremely hard to counter. For him the collapse of the negotiations was not a means to an end but an end in itself. Stalling negotiations proved his point: there was not, and could not be, a higher authority looming over warring states and their corporate patrons. Delegates invested a week and a half (out of the two-week SBI summit) trying to reach an agreement but these efforts seemed to backfire as their very failure vindicated the Russian delegate's main argument (in a way that was analogous to Republican obstructionism in the US Congress during the Obama presidency). "It was like proving that the seat belts are not working by crashing the car into a wall," an analyst argued. The metaphor was correct, although Shamanov claimed not only that there were procedural problems with the "seat belts" of consensus but also that the climate process as a whole should not be anything more than an extension of unending geopolitical and economic battles.

With only three days left in Bonn the chairman of the SBI (not the same diplomat as the president of the Doha COP) came to terms with the failure of this round of negotiations. "This is sad," he said:

But it is the unfortunate truth. [pauses] Distinguished colleagues, the rules of procedure are quite clear, all substantial decisions of the body have to be taken by consensus. . . . This [impasse] is beyond the ruling of any chair.

He spoke slowly and gravely, playing with his glasses in his hand and using the time between his words to look down at his notes. When not speaking his lips were pressed and slightly rolled into his mouth.

Despite efforts by all parties to find a solution on how to take forward the issues raised by Belarus, the Russian Federation, and Ukraine, this body is unable to arrive at consensus.

He let out a sigh.

At this point the delegation of Papua New Guinea (PNG) requested the floor to ask for a dose bureaucratic transcendence. "We in the audience," the PNG delegate said,

We heard our chairman sigh . . . it seems, judging by the sigh you made, [that] you may just walk off, leaving us here, all abandoned . . . It may be that you will decide that we do not carry out any function of this body, and you close the door, turn down the light, *everybody get out* . . . Please don't walk off. Please don't close the door and turn off the light.

He held his hands together between his knees and bent forward slightly, sitting like a child timidly explaining a bad deed just discovered by his parents. The sight was touching as he was a big man with a grave voice. He thought hard between sentences, pausing, thinking. He looked at the ceiling now and then, as if grabbing from above the words he was about to use.

. . . Consensus has become silence. And you have sighed. Mr. Chairman. Let me please request to you if you could kindly consider if the principle of necessity may assist you . . . if in your own mandate as Chair . . . You find it upon yourself the necessity, in order to save everybody, to gavel your way forward . . . consider necessity, gavel us through . . . there is no us and them, we are in this all together . . .

Whereas Shamanov's argument debased universal claims and "heroically" celebrated worlds barren of ideals, the PNG delegate underlined the exposure and

precariousness that worlds of endless immanence could entail. He modulated his voice to emphasize that, while his invocation of the principle of necessity was clearly irrational and a breach of procedures, it was not brutish or violently animalistic. There was no reason, PNG suggested, why appeals to a global "we" should always end up as a hypocritical disguise of selfish intentions—even if it entailed the violent silencing of some parties. He mobilized the principle of necessity not as an objective reality that would turn him into an unrivaled authority, but on the basis of the air weighing over the chairman he could also feel the sadness. He portrayed the consequences of failing negotiations as expulsion and abandonment, as exposure to climate disruptions that delegates of other nations rendered more explicit in the same round of interventions. Tuvalu explained that the continuing failures of the UNFCCC brought existential consequences to his nation and African diplomats expressed their contempt for the absence of a space in which to make decisions on "loss and damage" mechanisms.

Russia's delegate responded by arguing that the principle of necessity did not turn the plenary room into a well-lit inside but rather into a foul-smelling workshop in which, as Nietzsche put it, ideals are fabricated. Bad air! Bad air! "Procedures are in fact becoming hostage of emotions" he claimed, "and this is something we would like to avoid." Yes, Shamanov suggested, glaciers were collapsing; yes, severe climate disruptions were now unavoidable; yes, negotiations at the UNFCCC were advancing at such a slow pace that climate politics would do little to arrest unfolding catastrophes. However, he claimed, delegates should keep emotions at bay and be "civilized," which for him meant enduring the danger and embracing unbridled geopolitical and corporate competition. Diplomats should learn to breathe outside.

Shamanov's position was reluctantly adopted by the chair of the SBI who argued that "necessity must not be a justification to use any means to achieve a goal." A few minutes latter he added, "the chair is in the service to parties, but it is up to parties to save the word." This round of negotiations never took off and after two weeks of meetings the body adjourned without having started the negotiations. Only one of the two UNFCCC bodies carried out its work that summer (progress in the other body actually benefited from the SBI debacle as delegates worked particularly hard to have something to show as a result of their lengthy summit).

Although the events at Bonn were rather unique and SBI negotiations resumed six months later in Warsaw, they illustrate a dominant trend in climate diplomacy. It is increasingly difficult to arrive at agreements that are capable of limiting the power and influence of state or corporate bureaucracies. The problem is not only that technocratic dreams like the Earth Charter are no longer possible (I see this as a rather positive development) but that the weaving of open-ended, horizontal patterns has led to the unraveling of international environmental law. To put it in different terms, in the early 1990s it was possible to think that UN forums could work as interior spaces under technocratic management that could be gradually expanded to cover the globe (which would create an inside under expert rule). In the late 1990s as dreams of transcendence were dashed the hoped seemed to be that UN forums would connect people around the world in ways that would dampen the most destructive social and environmental trends. By the early 2000s, when the scientists with whom I worked in Amazonia took their REDD+ proposals to the UNFCCC, the objective they pursued was to take part in purportedly unstoppable geopolitical struggles. In these terms, as I show in the pages

that follow, REDD+ was a characteristically Amazonian contribution to the ongoing

demise of environmental ideals and to the proliferation of bureaucratic unpatterns at the

UNFCCC.

Part Three

Acclimatization

In 1992 Eduardo Viveiros de Castro described the religious underpinnings of

the then-dominant ecological imagination:

> Today the Amazon would occupy, not only allegorically, the place of the
> gothic cathedral: the tip of trees turns into a sacred canopy, the Hileia [forest]
> takes the form of the Spirit. And Society, which not long ago was the matrix
> and model of all order and all totality, is seen now as a cause of disorder, a
> suicidal *hubris* that may only be redeemed if it subordinates itself to a totality
> and to a global order that encompasses it and determines it. (Viveiros de
> Castro 1992b: 14)

For the anthropologist, in the early 1990s environmental policies designed to protect

pristine Nature were defined by a theological tenor that legitimized their vertical and

undemocratic proposals. For example, some environmentalists argued that Amazonian

forests should be managed by experts who, unlike peasants or traditional communities

living in the forest, could unveil the laws of Nature, understand the inner workings of

the basin's macro-ecological dynamics, and use their knowledge to preserve the region

from the polluting impacts of Society. Experts, Viveiros de Castro suggested, naturalized

politics while thinking of themselves as capable of helping societies transcend current

environmental problems to reach a higher, more perfect socio-environmental order.

Their lofty ambitions, seeking nothing less than the preservation of a well-ordered

cosmos, justified in the experts' view excluding non-experts from decision-making

processes and imposing hardships on Amazonian inhabitants.

In 2012 Viveiros de Castro argued that this traditional environmental approach

was currently withering in the age of the Anthropocene, a time that brings about a

"generalized collapse of cosmological scales" whereby the boundaries between Nature and Society become increasingly blurred (Viveiros de Castro 2012). Emerging Anthropocene geologies, he argues, precipitated a "landing" that forces environmental politics to focus on re-arranging material (atmospheric) conditions of existence that are now seen as inescapable (Viveiros de Castro, 2012). Gone are the days in which experts saw humans as animals of Nature and environmental politics were seen as arts of levitation—whereby ingenuity would allow humans to transcend material constraints and determine their own fate.

Among critical scholars, the withering away of the idea of Nature from climate policy forums and the ascendency of themes pertaining to the Anthropocene carry significant dangers associated with the possible return of naturalism through the back door. Recent studies demonstrate how, in some economic and political circles, the idea of the planet as a contingent system in permanent flux is mobilized in order to argue in favor of hyper-vertical policies such as geoengineering schemes that could place billions of people in great danger and hand over to a handful of people the power to tinker with and further disrupt global ecological processes (from monsoon patterns to the planet's albedo). From the perspective of this dissertation, the Anthropocene could lay the groundwork for new, aggressive processes of *total internalization* whereby the planet would be handed over to a select group of experts who would turn it into their own private workshop (Lövbrand, Stripple et al. 2009, Hamilton 2013). If naturalism in the age of Nature was, as Viveiros de Castro suggested, a quasi-religious project focused on transcending the material conditions of existence, naturalism-after-nature could sublimate a downward ecological spiral as transcendence in its own right—a way

of realizing humanity's potential through organized self-destruction.

Although the dangers of a possible return of Naturalism-after-nature are clear, dreams of transcendence (even downward transcendence) were virtually absent from UN forums—in which negotiation rooms did not stand as insides in which total internalization projects could be agreed upon. While critics of global eco-politics focus on the violence that the return of naturalist transcendence might bring, the violence that comes with experimental immanence is mostly left unexamined. If naturalism made parts of Nature (such as Amazonia) into something resembling a cathedral and rendered experts its priestly guardians, climate politics in the Anthropocene entails a violent, iconoclastic reversal whereby cathedrals are dismantled and experts stand as guides into worlds barren of ideals.

In the closing pages of this dissertation I examine how this iconoclastic drive intensifies as policy-oriented scientists designed REDD+ policy proposals as a contribution to the flows of documents, information, and people at the UNFCCC (which is to say, I examine REDD+ as a contribution to the iconoclastic unpatterns of international environmental law). I explain how until recently computer models of socio-environmental transformations tried—*and failed*—to influence global environmental law by depicting Amazonia as quasi-transcendental Nature.

REDD+ was the first global environmental policy designed for native forests to succeed at the UNFCCC. Its success was associated with its use of modeling tools and imagery that presented native tropical forests *not* as quasi-sacred spaces hovering above humanity but as regions immersed in expanding and intensifying agro-industrial flows. I show how REDD+ approaches and modeling techniques entailed flows of documents,

knowledge and experts that failed to result in bureaucratic patterns that could promise

less aggressive human/non-human relations. While traditional environmental policies

were feared for their capacity to bring to life a draconian power that could undermine a

local population's livelihoods and concerns by ignoring them, some of REDD+'s

intellectual progenitors feared their proposals could bolster capitalist forces that would.

I claim that REDD+'s most significant contribution to international environmental law

has *not* been, as most critiques suggest, a total system of signification whereby forests

are seen in terms of money and techno-managerial fixes are imposed upon local

populations. Rather, REDD+ has re-organized the field of forest conservation as a

training camp wherein leaders of social movements, climate diplomats, and scientists

learn the arts of wicked expertise, which is to say, they learn to live and work in

exteriors in unpatterned becoming.
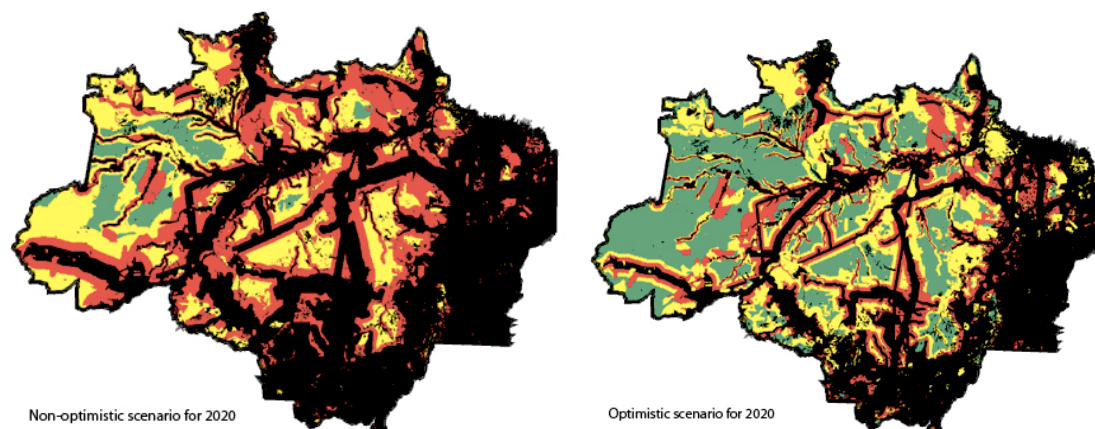

The End of the End Amazonia

Figure 51. Model "predictions" of deforestation and forest degradation in Amazonia by 2020. Left: a non-optimistic scenario. Right an optimistic scenario. From: *The Future of the Brazilian Amazon*, Laurance, Cochrane, et. al. 2001

Arguably, the last major computer model of socio-environmental dynamics that was designed to contribute to international environmental law with an image of Amazonia as pristine Nature was completed in 2001 (Figure 51). The model was intended as a critique of *Forward Brazil*, a development plan launched in the late 1990s by Brazilian state institutions that intended to invest 45 billion dollars in macro-infrastructure projects in Amazonia (Laurence, Cochrane et al. 2001). In an effort to slow *Forward Brazil*, scientists modeled the potential consequences of planned development investments. The conclusions, published in the journal *Science* under the title "The Future of the Brazilian Amazon," revolved around two images of what the basin would be like in 2020. An "optimistic" scenario displayed limited development investments that left patches of "pristine" forests standing in an otherwise fragmented region. A "non-optimistic" scenario portrayed unbridled development projects that would transform 42% of the rainforest, disrupting chemical and water cycles, fire regimes, and biodiversity with catastrophic global consequences (Laurence, 2001).

The authors claimed that in order to contain *Forward Brazil* and to avoid such catastrophic futures it was necessary to expand the Kyoto Protocol's emissions trading mechanisms the implementation of which was then under discussion (a final decision was reached in 2001). Up to that point, forests were considered in Kyoto Protocol debates only under "afforestation" and "reforestation" projects, thus including only *new* forests planted (afforested) in areas in which no trees had stood for at least fifty years or grown (reforested) in areas that had contained no trees since 1989. Under these proposals, industries in rich countries, rather than meeting Kyoto caps themselves,

could pay landholders in poor regions to plant forests that were supposed to capture a given amount of carbon from the atmosphere and turn it into biomass. They would discount the carbon captured by forests as offsetting their own emissions.

The authors of the "The Future of the Brazilian Amazon" argued that carbon market discussions at the time excluded the most important phenomenon in the tropical world: an increase in GHG emissions related to growing deforestation rates driven by projects such as *Forward Brazil*. Kyoto, scientists argued, should be scaled up so parties bound by the Protocol could pay landholders for keeping carbon on the ground in the form of *pristine* forests—thus offering an economic alternative to state development plans. Scientists substantiated their proposal with fear-inducing images derived from "predictive" modeling techniques. The authors drew on historical remote sensing imagery to establish that when *X* miles of roads were built in the past in Amazonia an area *Z* of forest was cut. The same analysis was completed for other major infrastructure projects and extrapolated into the future assuming a linear relation between human activities and environmental changes (which were compounded by feedback processes related to disruptions of fire and rain regimes). This linear analysis allowed them to suggest that a ghastly world was in the making and the world-healing powers of experts were needed to avoid such futures. Their diagnosis suggested only two possible alternatives: either follow scientific recommendations regarding Kyoto and forest carbon markets or Amazonia would collapse as they "predicted."

The article not only failed to influence final agreements regarding the Kyoto Protocol (which ultimately excluded native forests deforestation) but instead it received a barrage of criticism that clarified the political problems posed by using ideals of

Nature as a quasi-sacred entity in efforts to transcend ecological disruptions. An unlikely alliance of Southern politicians, environmentalists, and social movements joined forces to criticize "The Future of the Brazilian Amazon" in the online forum of the journal *Science*. They pointed out that, by trying to protect Amazonia from development efforts, the proposed carbon markets reduced the region and its human inhabitants to the role of an air filter operating on a planetary scale. In their view, while rich nations would benefit from the environmental outcomes of halting development programs in the region, Amazonian populations would suffer due to slower rates of economic growth. Other scientists attacked the assumption that socio-environmental dynamics were linear and could be "predicted." Politicians in turn argued that the model was an eco-colonial tool at the service of Northern geopolitical projects. Rather than being seen as priestly, objective voices looking after higher, global interests, scientists were attacked as mistaken at best or as covert agents pursuing devilish geopolitical goals at worse (Brazilian Embassy in London 2001, Nepstad, Moutinho et al. 2001, Schwartzman and Bonnie 2001).

The widespread opposition the article's proposal generated can be analyzed as deriving from the authors' fundamentally misguided understanding of the patternings through which international environmental law was woven together. Kyoto's cap and trade presupposed accounting procedures not unlike those which large energy companies, for example, used and had the capacity to incorporate within their operations. Carbon markets succeeded because they were not external to polluting operations and did not impose a foreign logic—which was possible thanks to environmental initiatives being linked to the bureaucratic practices of heavy industry.

Forest carbon market proposals on the other hand, relied on ecological knowledge that was foreign to Amazonian inhabitants that could be provided only by NGOs whose institutional orientation, as long as it remained focused on the protection of trees, was at odds with agricultural operations or traditional livelihoods. Brazilians and Amazonians saw that the studies, documents, information, and expertise needed to put in place forest carbon markets would render NGOs into active parties and landholders into objects of study and regulation. In blunt terms, many feared such a scheme would create bureaucratic infrastructures capable of placing the region under surveillance and hand Amazonia to foreign powers. The authors of "The Future of the Brazilian Amazon" mistakenly assumed that such fears could be broken by utilizing shocking visuals that would lead local populations to accept that vertical bureaucratic flows were preferable to outright catastrophe. This strategy, however, only reinforced initial doubts among Brazilian populations as it proposed bringing the region within vertical environmental structures. After all, the worlds created by the bureaucratic patterns of Northern technocrats would not necessarily be more inhabitable than a world ravaged by Brazilian development projects.

Against Catastrophism (Within Catastrophe)

The group of environmental scientists with whom I worked vocally opposed the modeling approach used by the authors of "The Future of the Brazilian Amazon." Although this second group of scientists also supported the implementation of forest carbon markets in Amazonia, their policy proposal, REDD+, was an explicit alternative to eco-politics based on the idea of Amazonia as pristine Nature. REDD+ designers

were insistent, for example, that theirs was not a "religious" approach based on faith in the healing powers of technocrats. Take Carlos for example, an environmentalist whom I mentioned in chapter three in the context of my analysis of REDD+ as "research in the wild." Carlos explained that the politics he pursued did not require believing in the work of experts. "It is not about believing in models," he told me, referring to the policies he championed:

> I do not think this is about believing. *This is not religion.* Humanity as a whole is going to have to take decisions in the very near future . . . this has to happen. It will happen. It is not a matter of belief. There is no water, climate, CO_2, temperature, in our planet to sustain this kind of evolution.

From Carlos's viewpoint, using visuals of catastrophe as old-fashioned environmentalists did in order to impact mindsets and effect global political changes was fundamentally misguided. The world would not change because of people's beliefs; it would change only as a result of disruptive human/non-human entanglements. His point, however, was not that catastrophe was unavoidable because people's views were hard to shape. I *never* heard him or any of his colleagues complain about non-experts who refused to follow their lead (a more likely target of their critiques were environmentalists who, they argued, insisted on portraying Amazonia as Nature). For him the problem lay not in stubborn human minds but in material worlds whose shifting forms were more complex than traditional environmentalists were willing to admit. Amazonia as Carlos saw it was a shifting landscape that could not be made into images in which anyone could believe. "A region like the Amazon," he explained,

> [has] several socioeconomic aspects—each pushing in its own direction. And

then several political aspects, several biophysical aspects . . . forest–atmosphere interactions. Right? To reduce *that complex network* of mechanisms to just a matter of pessimism or optimism is not possible. It is wrong. It is ridiculous reductionism. I think even infantile.

Carlos's Amazonia could not be represented in a single predictive image that in turn could be translated into a pre-defined plan. The basin was too dynamic, contradictory and unstable. A socio-natural network could not serve as the stage on which environmentalists could convincingly preach to the masses of the coming of a higher order. Like the approach of ANT scholars, Carlos's ontological understanding left no space for the separate spheres of Society or Nature and gave no opportunity to the utopian reconciliation of warring opposites. As a consequence, socio-environmental modeling was not seen by him or his colleagues as a blessed craft but rather as a deeply flawed undertaking. As one of Carlos's colleagues put it at a workshop attended by world-renowned environmental modelers, "after more than a decade of working together I think that today we all agree on one thing: our models suck." By that he meant that, while such models were still powerful tools for navigating highly complex worlds, models of Amazonian environments and their human-driven transformations were not capable of offering simple predictive images of what the world was or should be. Some time ago, the speaker added, "some people wanted to predict what would happen in the future of the Amazon. We found out that this was not really possible." He then stressed that predictive modeling efforts reinforced popular misperceptions of the region. As he put it:

> There are two cartoon images of the Amazon. One is of a huge sponge absorbing vast amounts of carbon and thus capable of preventing global warming. The second is that of a collapse of the Amazon that is imminent and unavoidable. Yes, there is a lot of carbon in the Amazon and a lot of

deforestation. But today we know that things are not so simple.

The problem with cartoonish images is that they were not only scientific but also political. Scientists committed to predictive modeling, pro-REDD+ scientists argued, ignored the fact that "catastrophe does not sell" and that their arguments made them look "like gringos who think they know best what needs to be done." The political challenge as they saw it was to avoid claims of quasi-religious authority that could lead them into playing the role of quasi-idolatrous fools who mistook cartoons for awe-inspiring images.

Unlike dualistic depictions of quasi-sacred Amazonia as the source of either salvation or catastrophe, my interlocutors' REDD+ proposals depicted the basin in *industrial* terms. They defined the basin as a source of carbon emissions derived from expanding capitalist operations whose ecological impact was comparable to that of Northern industries. As an industry-in-the-making, forests were not to be protected as a sink that could "cure" environmental ills thanks to its Natural powers. Instead, scientists proposed REDD+ to make it possible to pay landholders so they could invest in capital-intensive technologies capable of increasing agricultural yields without expanding pastures and farmlands into forests. Such payments would involve scientific studies of reductions in deforestation rates in relation to the deforestation that would have taken place in a "business as usual scenario" (a post-facto approach that avoided the pitfalls of previous reforestation proposals). The analysis, however, would also be based on agricultural information regarding the costs of agricultural investments as well as indigenous and traditional assessments of the livelihoods that REDD+ should support. Overall, the approach was based on the post-Natural assumption that forests, humans,

and the basin's rural industry were immersed in global rural commodity flows that would continue to shape the macro-ecological functioning of the basin (even if deforestation was contained thanks to yield-enhancing technologies, REDD+ proponents knew that a new agro-industrial scheme would entail agrochemical runoffs and other massive macro-ecological impacts).
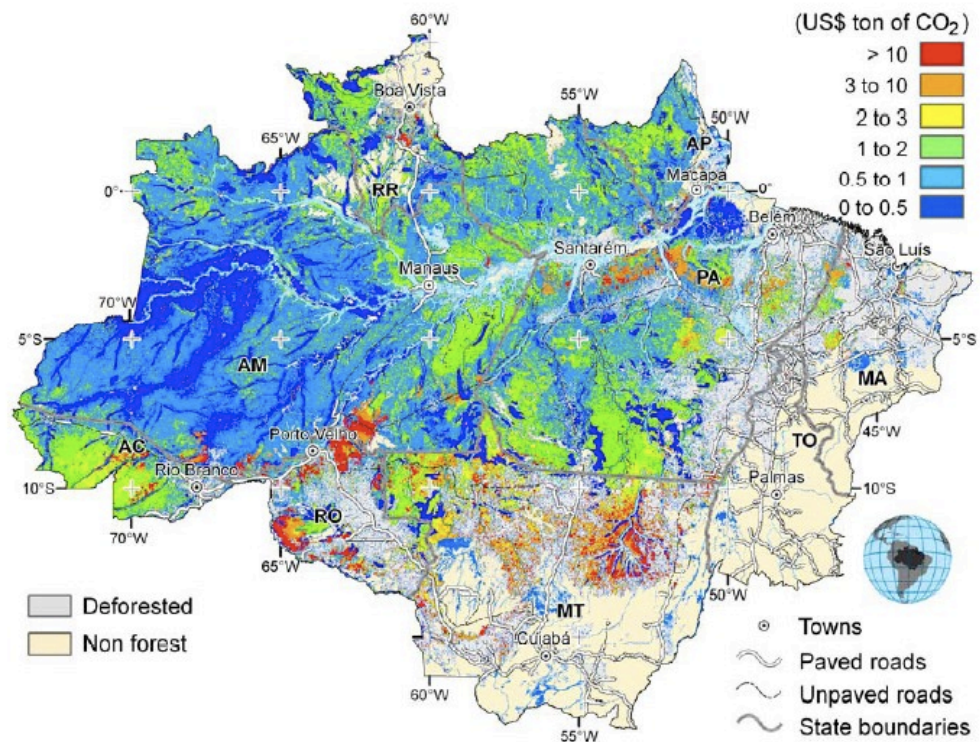
Figure 52. Model estimations of future carbon payments under REDD+. From: The End of Deforestation in The Brazilian Amazon, Nepstad, Soares-Filho, et. al. 2009

The models mobilized in support of REDD+ proposals offered imagery that renounced idealistic assumptions of a more harmonious cosmos to come. Figure number 52, for example, shows a pro-REDD+ study that models the potential returns on investments in transforming forests into pastures and farmlands (Nepstad, Soares-Filho et al. 2009). Sites close to roads and urban centers, shown here in red, were depicted as promising large economic gains from deforestation. Meanwhile, more remote areas in

blue were signaled as those in which returns were likely to be smaller. Based on such analysis modelers estimated how much carbon markets should pay landholders per ton of carbon in order to offset opportunity costs. In areas in red that amount would have to be more than 10 dollars per ton of carbon while in other areas forest conservation would come much more cheaply.

Unlike "The Future of the Brazilian Amazon," estimates and visuals were not designed to dissuade enterprises from moving into Amazonia but were intended to show landholders new opportunities for economic speculation. A scientist I will call Bento, whose models where crucial to the success at the UN of new-generation carbon markets, told me in this regard that "I like to say that what I do is cartography," he argued, only to add, "but there is a difference. Mine are animated maps." Bento's models, which focused on animated socio-economic processes, had little to say about what Amazonia was or should be. He offered "scenarios" instead which depicted how various socio-natural dynamics would produce distinct macro-ecological outcomes. For example, his maps showed how, if landholders were to invest in capital-intensive technologies to increase yields rather than to expand farmlands, deforestation could drop below the baseline and the basin's macro-ecological attributes could dramatically shift. Similarly, his work showed how, thanks to the presence of indigenous communities (and, therefore, thanks to indigenous livelihoods) deforestation in much of Amazonia had been lower than the regional baseline. Were indigenous land rights to be promoted, Bento argued, less acute environmental crises would await the region.

By emphasizing movement and socio-natural entanglements, REDD+ proponents were able to decouple their scientific imagery from bureaucratic

machineries focused on punishing environmental crimes. For a long time, remote sensing imagery and modeling tools were seen by the Brazilian states as foreign tools whose presence indicated the arrival of political structures bent on imposing draconian restrictions on Amazonian development. Environmentalists (Brazilian and non-Brazilian alike) had to struggle hard to make reliable remote sensing data on deforestation available—and even when this information became available it was not incorporated into the bureaucratic flows of federal development institutions or environmental bodies. Similarly, the mobilization at UNFCCC of remote sensing technologies and modeling tools was strongly opposed by tropical countries on the grounds that it could lead to imposing restrictive policies upon these countries (Fearnside 1990, Baker and Williamson 2006, Rajão and Vurdubakis 2013). REDD+ imagery allowed for satellite imagery and models to be woven together with data coming from agro industrial and development bureaucracies without implying the summoning of a higher power capable of imposing normative limits on economic growth. These changes were perceptible on the ground. People in the *assentamentos* with whom I lived, having committed what in the eyes of environmental authorities were environmental crimes, were highly distrustful of remote sensing technologies. In the context of REDD+ projects, however, they saw satellite imagery to be associated with novel economic opportunities about which, as I noted in chapter two, *assentados* had highly ambivalent feelings (Figure 53).

Figure 53. Satellite imagery in the *assentamento*

Conclusions

Ghosts and Spirits of Capitalism

Against the "religious" danger of traditional environmentalism, REDD+ proposals were an effort to place agricultural technologies, local livelihoods, and infrastructures at the center of forest carbon markets. The scientists with whom I worked strived to build a more horizontal policy landscape in which nonscientists could become document-makers, or at least central protagonists, in REDD+'s implementation. In this sense, REDD+ was successfully embraced by a broad network of institutions ranging from financial concerns to social movements (which, although they were divided and ambivalent about REDD+, used arguments and models such as Bento's to ask for a moratorium on all macro-development projects in the Amazon basin as a pre-requisite of REDD+).

REDD+ *did* offer an alternative to vertical flows of experts, environmental data, and environmental knowledge that thus far had composed technocratic policies for tropical forests. This explains why, from 2007 to 2012, REDD+ was pretty much the only meaningful item on the UNFCCC agenda on which significant progress was made (Agrawal, Nepstad et al. 2011). But if the patterns woven by traditional environmentalists were haunted by the Spirit of Nature and ended up playing into debased, technocratic and geopolitical projects, pro-REDD+ scientists faced their own ghosts. Bento told me, referring to his animated maps:

> These maps have a great power to promote ideas, to disseminate knowledge. For example, my animation of future scenarios of deforestation in Amazonia may be one of the most circulated in presentations made by academics, NGOs, and politicians working in environmental forums.

These maps, like Riles's documents, had a power that was derived from non-representational practices. Bento did not offer an idea or still image that could inform a single political principle that could find its way into the minds of scientists and diplomats. His models circulated, could be linked, or be plugged into PowerPoint presentations and a wide range of bureaucratic flows thanks to their laconic meaning and lack of normative prescriptions. The models elicited a particular form of pride—not associated with the foresight to anticipate utopia but with the capacity to produce artifacts that could flow into diverse bureaucratic streams (Figure 54).

Figure 54. Social leaders discuss the "Indigenous REDD+" proposal

Guilt, however, mixed with Bento's pride as he considered the increasing popularity of REDD+ proposals. "I feel a bit guilty because [environmental consulting

enterprises] use models I developed . . . as a crystal ball." By this he meant that

environmental consulting companies manipulated his modeling tools to create fictitious

carbon reductions. "The [modeling] methods they use [to generate carbon credits] do

not make any sense whatsoever," he confided, and added that REDD+ schemes turned

out to be "an illusion, I mean, a collective delirium." A delirium that was not only

misleading, but that created what he called an "industry" with consultants, institutions,

and universities looking for ways to capitalize on this policy approach. He portrayed the

problems he helped create with his modeling work as like those involving the

summoning of a debased and polluting power whose influence was expanding and

intensifying:

> it is complicated the situation of REDD+, it, it has taken a path, the market it
> created, the market is not dumb, it is autonomous, it created a cycle that grows
> on itself, it feeds on itself, it feeds of REDD+ certificates, now you have
> derivatives, it, it has disseminated around the world. I do not know if this is the
> best way . . .

Bento was talking rapidly at this point and he leaned back in his chair, taking his

head into both of his hands. This was not an easy topic and he was glad to discuss the

predicaments in which he was involved. He was still supportive of REDD+ but like

many other of the intellectual progenitors of this policy approach, he took every

opportunity available to him to underline its most important shortcomings. REDD+

proponents, for example, organized a side-event at Rio+20 to which they invited some

of the most vocal critics of forest carbon markets. They themselves took to the stage and

argued that REDD+ had become a fragmented scheme that was not very different from

irrational beliefs in magic or forest spirits. Some of the most important NGOs funding

REDD+ projects paid to bring indigenous leaders to UNFCCC summits even when

these leaders spoke against REDD+. It often seemed to me they were trying hard to compensate for some of the impacts their policy was having in the poorest and more vulnerable communities.

Environmentalists who, like my interlocutors, actively contributed to the collapse of cathedral-like political cosmologies had not resolved the problem of a non-human monster disrupting their well-intended plans. They did not fear the rising up of an ecological Leviathan any longer, but the networked worlds they inhabited, even while lacking depth or transcendence and being foreign to the violence of representation, teemed with human-bred, non-human monsters. Bento and his colleagues had hoped that REDD+ proposals at the UNFCCC, by undermining transcendental proposals, would gradually lead to an emergent global design in international environmental law. Their approach was similar to the Kyoto Protocol's use of carbon markets as an alternative to top-down approaches in environmental law. Like Kyoto, REDD+ was to be composed by networked and decentralized structures operating on the basis of minimal juridical agreements. Unsurprisingly, such minimal agreements failed to materialize as they led to a series of questions regarding bureaucratic patterns that proved insurmountable: How should satellite imagery flow? Should donors follow deforestation in Southern forests with their satellites or should Southern nations provide their own reports based on their own satellites' information? Who should oversee the role that local communities play in market transactions, Southern nations or donor parties? How should livelihoods be protected? Through what channels should monetary payments reach tropical forests? All these questions led to endless debates, some of which remain open today.

What REDD+ proponents anticipated would be a weaving of international politics resulted instead in yet another instance of the unpatterning of international environmental law. At the time of my fieldwork, some of the main figures involved in REDD+ projects had developed a characteristically nihilistic understanding of international environmental law. For Carlos, for example, his work as a policy-oriented scientist required him to work towards a future that would unavoidably bring

> a really difficult situation from the point of view of food production, energy availability, and even wars, widespread struggle. Those who now dominate consumption patterns—which today are the US and Europe—will not want to change their consumption patterns. And those who do not want [current powers to maintain their] consumption patterns (Africa, Asia, Latin America) are going to struggle [against the US and Europe].

Although Carlos alluded to "patterns" in the sense of statistical regularities (rather than in Riles's meaning of "pattern" as aesthetic form) his argument makes it clear that something more than words, documents, and bureaucratic artifacts were involved in the (un)patterning of international environmental law. The patterns he and other REDD+ proponents sought to inhabit belonged to "smart," "powerful," unstoppable markets bolstered by national powers hell-bent on defending "consumption patterns" (access to land, heavy industry installations, technology, and energy). According to Riles, bureaucratic artifacts left an imprint on the world but not as a result of providing a recipe for an eventful leap towards utopian worlds. Bureaucracies as she studied them altered reality at the immanent level of practice and artifact-making. In her words, legal practices "*internally* generate the effects of their own reality by *reflecting* on themselves" (Riles 2001: 3, emphasis added). Riles calls this "institutionalized utopianism," or the furthering of the inside within which legal practices are advanced

(*idem*). This, however, begs the question: What happens if legal practices generate the effects of their own reality not by "internally reflecting on themselves" but "externally," by "plugging" into large-scale destructive forces? Could one then speak of "institutionalized" or "networked catastrophism"? A situation in which catastrophe is detached from transcendental/technocratic ideas of sin and salvation and instead is offered to us as a result of the creative unravelling of socio-ecological patterns?

The unpatterning of international environmental law paralleled the planetary unravelling of socio-ecological patterns. At the UNFCCC I studied the melting together of environmental politics into environmental disruptions. Shamanov's stance, for example, resembled Golbery's geopolitical plans in its renunciation of ideals and the civilized foray into a foreign planet materially made of warring—corporate and state—machineries. REDD+ proposals contributed to such unpatterning and to the dismantling of the UNFCCC as a place that could be seen as capable of offering shelter from the most destructive forms of politics and economics. Acting somewhat like Chauvel's worms or Margaret's towers, REDD+ proponents brought *within* UNFCCC plenary rooms the radical exteriority of Amazonian *mato* (ever-shifting configurations of humans, soils, inputs, capital, and agro-industrial commodities that seemed capable of dissolving human insides and throwing the poorest, most vulnerable peoples into extrinsic living). REDD+'s particular unpatterning also responded to the non-representational aesthetics of exposure that allows scientists to constantly cultivate capacities and dispositions needed to breathe in the open and turn an "inside" (that of environmental ideals) into an exterior of ceaseless experimentation.

Such an anti-idealistic state of affairs brings to mind Nietzsche's point about the

humans (the spirits) that would be required to build worlds of radical immanence and becoming. Such worlds "would require a different kind of spirit," he wrote,

> who, strengthened through wars and victories, have developed the need for conquest, adventure, danger, pain; it would require acclimatization to sharp, high-altitude air, to winter expeditions, to ice and mountains in every sense, it would even require a kind of sublime wickedness." (Nietzsche 2008: 75)

Wicked experts, in their sublime taste for thin air, do not flourish in total insides but rather strive to break away from them. Pro-REDD+ scientists like Bento are somewhat like such spirits as they contribute to efforts they know to be far from ideal and, more so, hope to undermine the ideals of ecological romanticism. However, thanks to Nietzsche we can see that despite their iconoclastic bent, the wickedness in pro-REDD+ scientists may lie less in what powerful beings they themselves have become than in the debased powers to which they have given room. As I will show in the concluding pages of this dissertation, documents and imagery associated with REDD+ arguments allowed Brazilian politicians to claim the status of world environmental power for their nation. The path is open towards exteriors in which nihilistic politicians, extremely powerful and world-shaking beings, now roam and thrive.

Dissertation Conclusions

Exterior Design

Hours shy of the end of Rio+20 and, in the heat of a loud discussion in a high-level side-event, Isabella Teixeira, Brazil's Minister of the Environment, held the microphone in one hand and newspaper transcripts from which she angrily read in the other. She shouted:

> I am going to read what the press is writing. [pause] The conference finishes leaving only promises. [pause] A tone of disappointment characterizes the closing speeches at the conference. [pause] The conference ends in failure.

Finished reading, she held the transcripts over her head, exposing their content to the audience. Her voice had grown louder with every word and towards the end she yelled into the microphone:

> You know what news are these? News . . . newspapers from 1992! The truth is here! Those of us who fight for sustainable growth had to endure these obstacles since before 1992!"

Teixeira's intervention was a response to two protesters who interrupted a conference panel she chaired in which ministerial-level state officials and civil society figures from Brazil and Europe celebrated Brazil's role as a global environmental power. Two speakers offered particularly significant interventions. The first of these was Tasso Azevedo, a self-described "forestry and climate change consultant and social entrepreneur" who brought to the room what he called the "good news" that "for the first time in history, deforestation is actually going down." He argued that, whereas during the 1990s average global annual deforestation rates were on the order of 16 million hectares, during the 2000s these rates fell to 14 million hectares. Moreover, he

added, Brazil's participation in world deforestation fell from 25% in the 1990s (4

million hectares per year) to 13% in the 2000s (1.8 million hectares per year). Based on

these numbers Azevedo claimed that Brazil had "by far, the largest reduction in carbon

emissions in United Nations history."

Azevedo's claims appropriated previously discussed modeling techniques that

addressed forests as analogous to industrial installations. Deforestation rates were

falling "for the first time in history" if by "history" we understand only a conveniently

restricted time period limited to the most environmentally destructive years of the

twentieth century. Only in this context could the destruction of 14 million hectares of

forest per year be considered "good news." Similarly, Brazil could be said to have

achieved great "reductions in carbon emissions" only according to models that

anticipated even higher emissions under a "business as usual scenario"—in comparison

with which deforestation in 1.8 million hectares could be interpreted as an achievement.

After Azevedo, Lucio Coutinho, the president of Brazil's National

Development Bank, described how the institution he presided over had joined forces

with 19 other national development banks to disburse 89 billion dollars in projects

"associated to environmental sustainability." He explained that these banks recently

"agreed to make a great effort so these disbursements will grow in the following years"

and added that the banks also agreed to "exchange experiences among us." His rhetoric

was exemplary of bureaucratic unpatterns: vague plans of action ("agreed to make a

great effort") and non-legally binding modes of cooperation ("exchange experiences")

that granted environmental responsibilities to entities intimately concerned with

furthering national economies in a global competition. Such statements allowed

Coutinho to ignore the Bank's investments in environmentally disruptive projects in

Amazonia, several Latin American countries, and Africa, where his institution

supported industrial agriculture, animal protein production, mining, and macro-

infrastructure projects. The Bank's environmental claims were particularly jarring, as

development projects and expanding capitalist operations in Amazonia coincided with a

historic spike in violence against environmental and indigenous leaders in the region

(Canuto, da Silva Luz et al. 2014).

As the violence of capitalist flux was acknowledged, celebrated, and

disavowed all at once, two demonstrators stood silently in the back of the room holding

signs protesting the Brazilian government's environmental record. As Coutinho finished

his presentation one of the protesters lost his composure and yelled, accusing the bank's

president of lying. "What is being said now in this table is a lot of lies," he stated loudly

but calmly. The public, mostly government officials, booed him and clapped in order to

drown out his voice and the protester, raising his voice, added that neither the bank nor

the Brazilian government could legitimately claim to be realizing the goals of the

environmental movement. In a few seconds UN security services closed in on him and

were about to take him out of the room when Teixeira graciously demanded, "let him

finish, let him talk," wisely letting her opponents come into the limelight. Her approach

to climate politics was *not* based on ideological erasure or on simulating the

perfectibility of techno-managerial plans and therefore she could handle (and even

benefit from) protest. She could prevail through asphyxiation rather than outright

censorship.

The protester's intervention, unprepared to begin with, quickly unraveled in

repetitive circles. It was also hard for him to project his voice in the room without a microphone and his argument was soon reduced to variations of "this is a lie" yelled in an increasingly visible shortage of air. Teixeira seized the ever-growing gaps between his words to loudly ask into her microphone, "Can I talk? Can I talk? Let's respect the people in the room, please, please . . ." Her words further disrupted the protester's precarious line of reasoning and consumed his fainting energies. He burned out.

At this point, as though in a sprint relay, the second protester took off. She was also young and was also unprepared but offered a novel and refreshing line of attack: "We are against our government because they do not respect the Brazilian people, they do not respect the Amazon rainforest," she cried. "This is bullshit for gringos to hear." She then forcefully reminded the audience about highly disruptive infrastructure projects in the Amazon and indigenous struggles against them. She mentioned that a new forestry code that scaled back environmental regulations in Brazil was approved by the Senate under pressure from landed interests. She claimed that, like the 1992 meeting, Rio+20 was highly undemocratic, held in a highly secluded compound, and was heavily criticized by social movements in a march that had effectively paralyzed Rio de Janeiro the day before. She was off to a great start. But her improvisational skills soon started to run out as her fast and furious speech consumed her breath. It became hard to make her voice heard as the pro-government audience's rumble grew louder. Teixeira continued to seize every chance to wedge in. "Can I speak? Please, please." It worked. Two minutes after the second protester took the floor she grudgingly gave it back to the minister, who underlined her all-embracive containment strategy:

this is a democratic space, you interrupted the discussion, so I have the right to speak . . . people here [in Brazil] have the right to express their opinion legitimately. If this was a lie we would not have the lowest deforestation rate in history . . . I am hearing your protest, I am hearing your protest . . .

The audience clapped. The room was hers again. Teixeira recognized the problems with macro-infrastructure projects in Amazonia, distanced herself from such initiatives, and argued that the government and civil society organizations had to work to limit their socio-environmental impacts. She also agreed on the problems posed by the forestry code but pointed out this outcome was the result of the democratic process and the forces represented in the judiciary. Her main point, however, was that her opponents were naïvely attached to romantic images of Amazonia that she, having worked more than three decades in environmental institutions, had learned to forego.

She claimed that the protesters ignored the "social qualities" of the country and that under current environmental laws 80% of small rural households were seen as environmental criminals. Rather than criminals, she claimed, poor rural populations were victims of state-led colonization projects and would suffer greatly under draconian conservation policies. Moreover, she suggested that the protester's campaign for stricter environmental regulations could worsen land and wealth concentration in a country in which (she quoted these numbers by memory) 90% of small landholders in Brazil owned only 24% of the land while, she added, 10% owned 76%. She stressed, time and again, that the administration tried to include as many voices as possible—both in their environmental policies as in debates such as these—and that all points of view were welcomed. "You help us build the solution. There is no reason why you should stay in a passive position" she argued. "Come with us in the ministry of the environment" she

concluded. "Stop dividing . . . because we are already few. Let's build. Have a good night, and thank you very much."

Teixeira did not place herself above her critics or lecture about how expert knowledge could secure a well-climatized inside in which Society and Nature would be legible, commensurable, safe, and beautifully connected. Quite the opposite; after portraying the protesters as naïvely attached to romantic images of a perfectible world, she submerged herself in the heat of the debate and in a deeply emotional argument as boisterous as that of her opponents. Her furious retort to the protesters added to the breaching of the side-event's protocol and contributed to disjointed patterns of interaction in the room. The intensity of the exchanges echoed the contradictory socio-natural worlds that Teixeira described as her object of concern. Extreme land and wealth concentration, a federal government committed to macro-infrastructure projects, a legislative body captured by landed interests—Teixeira presented all these limitations as part of a world that could never be arranged according to a single socio-ecological approach. She presented herself as the wicked leader who was capable of working in this impossibly imperfect world in which success was redefined as the capacity to endure failure.

This argument was not conveyed through propositions that conveyed self-consistent ideas or blueprints of beautiful futures. The minister's performance was successful in silencing her opponents thanks to material interventions. She regulated her voice, emotively mobilized statistics, and made strategic use of such technological advantages as having a microphone. She was less an expert in the arts of discourse and

representation than in that of breathing—the thrusting forward of air and sound that filled rooms with arguments that although technically meaningless (they did not point to a definite something out there and only signaled an endless construction project) drowned out some people and moved others along with her.

Teixeira's asking her opponents to "come with us in the ministry of the environment" and help her "build" emerging environmental politics can be interpreted as an invitation to construct climate exteriors that make it possible to recapitulate this dissertation's arguments. Teixeira's willingness to "build" while submerged in worlds in flux contrasted with Lévi-Strauss's melancholic lines in the closing page of *Tristes Tropique*s: "the world began without the human race and it will end without it" (1955 [1974]: 397). For him the idea that humanity inhabited a world ultimately indifferent to it precluded any meaningful political engagement. Establishing relations with other humans and non-humans in order to make something out of a shifting planet would ultimately contribute to entropic dynamics that one day would wash humanity away. Paradoxically, he found solace in glimpses of a "human essence" Lévi-Strauss found in the non-human forms of crystals, the smell of lilies, the intense gaze of cats . . . (*idem*: 398). His melancholic attitude precluded any political engagement and left no other alternative than contemplative inaction. This is one the challenges that those involved in climate politics today face. Catastrophism may settle down with the sense of fluxes that are capable of collapsing material worlds in which humans may hope to dwell. This sense experience may lead either to Levi-Strauss detached contemplation or to its structural opposite: Teixeira's nihilistic embrace of horizons of destruction.

Teixeira's arguments mobilized some analytical tools used by REDD+ proponents in a convincing rejection of Lévi-Strauss's catastrophism that made political actions possible even in anticipation of worlds "without us." Facing the crumbling of the familiar, she and like-minded environmentalists cultivated feelings of concern and solidarity for poor populations for whom well-being was associated with intensifying *movement* (flows of commodities, money, and people). However, while Teixeira recognized the claims and desires of small landholders in Amazonia, she ignored the ambivalence and self-doubt that accompanies poor populations' efforts to take part in the flux of capitalist economies. The problem is not, I think, that she and experts like her ignore other peoples' suffering or the "slow violence" that afflicts persons and groups exposed to environments disrupted by industrial equipment (Nixon 2011). The issue is that she mistakenly equates solidarity with supporting self-fashioning efforts through which poor populations painstakingly make themselves experts in the arts of extrinsic living. Her arguments, like those of market-oriented environmentalists, remake the politics of solidarity into the breeding of self-interested and egotistical beings whose dominance forecloses the possibility of building worlds in common. It thus becomes difficult—if not impossible—to differentiate between genuine solidarity and the nihilistic embrace of the idea that the most vulnerable should adapt to the collapse of the environmental systems that sustain their livelihoods.

Similarly, Teixeira's claim that her government heard all voices and that thanks to this Brazil had "the lowest deforestation rate in history" represents the aesthetics of open-air experimentation. Like Azevedo's celebration of deforestation rates of 14 million hectares per year, her argument made use of a growing volume of scientific

information regarding unfolding environmental crises. This information is available today thanks to the continued struggles of scientists and social movements who have hoped that rendering shocking environmental crises visible would transform eco-politics (Baker and Williamson 2006). As a result Brazil not only has one of the world's most sophisticated environmental monitoring systems and real-time data on deforestation, but singularly fluid relations between NGOs and the government. However, the increasing transparency and visibility of climate issues has taken place in parallel with a shift in techno-scientific aesthetics whereby environmentalists no longer seek to make the planet into a beautiful oeuvre—and instead strive to take part in the endless experimental re-arrangement of fragments that result from anthropogenic ecological shifts. Teixeira's argument was not about preserving "forests" that could "save the planet," but about a more complicated (and contradictory) picture wherein deforestation rates, macro-infrastructure projects, and agricultural production are linked into configurations that, while never ideal, we may grow to find acceptable.

This is why the protesters ultimately failed to break up Teixeira's celebration of climate politics in Brazilian Amazonia. They exposed how incomplete, imperfect and contradictory were the government's actions and how unsightly were the worlds that emerged as a result. But such revelatory interventions could not undermine an eco-political argument that needs no consistency, wholesomeness, or beauty and that instead preys on unashamed exposure. She used the ghastly images their opponents threw at her to make the case that there was much to be gained from foregoing naïvely elitistic dreams of total orders and that we should all embrace horizons wherein crises brought into being unprecedented worlds. Her calls for unending eco-political experimentation

blurred the boundaries between the creativity that is needed to manipulate earthly fragments and the madness that is required to partake in the melting away of worlds.

Finally, Teixeira's performance elucidates the politics of environmental transcendence after Nature has withered. Her masterful dealing with the protestors evinced her unrepentant embrace of a climate politics process that demonstrably and quite publicly failed to avoid potentially catastrophic climate change. After working for more than two decades in environmental bureaucracies, Teixeira knew that plans presented as capable of transcending geopolitical differences often served to advance particular agendas. From her perspective, the absence of a planetary environmental plan was a success of sorts, achieved with the help of poor and developing nations who contributed to foreclosing the emergence of a global sovereign capable of manipulating ecological agendas to impose its rule. As part of the forces that devolved international environmental law into endless unpatterns of never-ending chains of meetings that resulted in meaningless texts succeeded in situating global environmentalism at the immanent level of capitalist and industrial exteriors. She helped brought environmental law within depthless, flat networks, wherein any effort to transcend climate crises could be denounced as hypocritical prayers offered to a false God.

Such an iconoclastic and nihilistic stance offered an unusually clear view of worlds indifferent to our modes of living, which were partly created by unpatterned juridical rituals. Rio+20, like other recent UNFCCC summits, sanctioned the collapse of worlds in common and put on display shocking sights of unfolding socio-environmental crises. The ritual acts by which international environmental law achieves such outcomes are non-propositional and non-rational. They draw on physical displays of force that are

most visible in the capacity for breathing the thin air of rooms in which ecological

ideals are shattered and juridical transcendence is disavowed. It may be, though, that in

their commitment to immanence such acts achieve their own, singular transcendence.

Could we not see here an unacknowledged *geological ritual* driven by the debased

forces of capitalist markets and industrial equipment? Such forces are summoned to

accomplish what, through human eyes, seems like the ultimate leap of transcendence: a

mass extinction and the dissolution of humanity's recognizable inside within a planet

that we design as wildly exterior to us.

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