ONTO-CARTOGRAPHY

AN ONTOLOGY OF MACHINES AND MEDIA

LEVI R. BRYANT

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Acknowledgments

Series Editor's Preface

Levi Bryant's *Onto-Cartography: An Ontology of Machines and Media* is the second book in the Speculative Realism series at Edinburgh University Press. It is a remarkable effort by an author who has established himself as an irreplaceable figure in contemporary philosophy. Bryant's early work was strongly influenced by Gilles Deleuze and the psychoanalysis of Jacques Lacan, and the lessons learned from these figures still animate Bryant's thinking today. In an age when better and worse philosophy blogs proliferate, Bryant's widely read "Larval Subjects" blog remains the most formidable gathering-point for younger philosophers in the Continental tradition. Every post on the blog reflects Bryant's omnivorous reading, his willingness to let his position evolve in the face of new evidence, his boundless appetite for dialogue with readers, and even his colorful autobiography, rare among academic authors. One of the most exceptional (and amusing) features of Bryant's life history, as lucidly retold on his blog, is the fact that he wrote his PhD dissertation *before* his MA thesis – since his advisors at Loyola University in Chicago felt that the MA was too substantial a piece of work to be wasted on a non-terminal degree, and thus asked him to write a shorter work before resubmitting the initial thesis for his doctorate. Bryant's candor and his lively style have led to famous polemical disputes with detractors, but have also earned him thousands of admirers across the globe. He is also an active international lecturer, increasingly influential in fields well beyond the discipline of philosophy.

Bryant has published two books prior to this one. The first was his highly regarded book on Deleuze, *Difference and Givenness: Deleuze's Transcendental Empiricism and the Ontology of Immanence* (2008). Many readers regard this as the best available work on Deleuze's masterpiece *Difference and Repetition*, despite

the crowd of worthy contenders for that honor. It was shortly after the publication of his debut book that I became personally acquainted with Bryant, an intellectual friendship that had profound consequences for both of us. He quickly became a key figure in the movement known as "Object-Oriented Ontology" (or "OOO"), a term that Bryant coined himself in 2009. His involvement with the object-oriented paradigm and the work of Bruno Latour led to his second book, *The Democracy of Objects* (2011). It is a book of numerous merits, but is perhaps most noteworthy for its synthesis of an astonishing range of thinkers: from established continental notables such as Badiou and Deleuze to still-underutilized authors including Francisco Varela, Humberto Maturana, and the German systems theorist Niklas Luhmann. Beyond its many intriguing references, the book is characterized by a freshness and lucidity that make it likely to be read for decades to come.

Given Bryant's unusual capacity for intellectual growth, the reader will rightly expect yet another new turn in his latest book. The rallying point of *Onto-Cartography* is the word "materialism," which Bryant wants to defend from its admirers and its opponents alike. Though he is an ardent materialist opposed to any appeals to immaterial reality, it is Bryant's other critique that will hit closer to home: his impatience with so-called materialists who become lost in the forest of text-based cultural studies. As he wonderfully puts it:

> Having brought about the dissipation of the material in the fog of the diactrical differences of the signifier, there was no longer a place for thinking the real physical efficacy of fossil fuels, pollutants, automobiles, sunlight interacting with the albedo of the earth, and so on. Even among the ecotheorists in the humanities we find a preference for discussing portrayals of the environment in *literature* and *film*, rather than the role that bees play in agriculture and the system of relations upon which they depend.

Although Bryant expresses some embarrassment in having been converted to his robust materialism by the videogame *SimCity*, in which the placement of non-discursive entities such as power lines, factories, museums, and sports arenas has tangible effects on the populace, his embarrassment is already obsolete – note the recent surge in serious attention to videogames (by thinkers such

as Ian Bogost) as a profound political tool and a form of high art in waiting.

Bryant's conclusion that the world is made up entirely of material rather than purely signifying or discursive realities amounts to a vision of "units or individual entities existing at a variety of different levels of scale . . . that are themselves composed of other entities." This leads him to formulate a *machine-oriented ontology* that forms the backbone of the book now before you. Entities are machines because they "dynamically *operate* on inputs producing outputs." Further, this theory becomes a cartography insofar as it develops "a map of relations between machines that analyzes how these assemblages organize the movements, development, and becoming other machines in a world." Ultimately, Bryant's recent work aims at a new form of political philosophy: "The aim of onto-cartography is not to close off styles of inquiry, but to expand our possibilities for intervening in the world to produce change so as to better understand how power functions and devise strategies so as to overcome various forms of oppression."

Onto-Cartography is not only a thought-provoking and erudite book, but also a thoroughly enjoyable one. It will prove immediately accessible even to those who are unfamiliar with Bryant's previous work. Much like the powerful blog posts for which he is famous, this book offers another path into the coming years of philosophy.

Graham Harman
Cairo, June 2013

For the banyan trees, sequoias, cephalopods, capybara, tanukis, tardigrades, microbes, viruses, Amazonian rain forests, coral reefs, and hitherto yet unimagined technologies.

Introduction: For a Renewal of Materialism

This books attempts a defense and renewal of materialism. This is a defense and renewal needed in the face of critics and *defenders* alike. On the side of the critics, materialism must be defended against obscurantists that seek to argue that materialism is reductive, mechanistic, and that there is something about human beings, culture, thought, and society that somehow is other than the material. However, it is perhaps the defenders of materialism that are today the greater threat. Among Continental critical and social and political theorists, we are again and again told that they're positions are "materialist," only to see the materiality of matter up and disappear in their analyses. In these discourses and theoretical orientations, the term "materialism" has become so watered down that it's come to denote little more than "history" and "practice." It is certainly true that matter evolves and develops and therefore has a history, and practices such as building houses engage with matter. Unfortunately, under the contemporary materialism, following from a highly selective reading of Marx, "history" has largely come to mean *discursive* history, and practice has come to mean *discursive* practices. History became a history of discourses, how we talk about the world, the norms and laws by which societies are organized, and practices came to signify the discursive practices – through the agency of the signifier, performance, narrative, and ideology – that form subjectivities. Such a theory of society was, of course, convenient for humanities scholars who wanted to believe that the things they work with – texts – make up the most fundamental fabric of worlds and who wanted to believe that what they do and investigate is the most important of all things. Material factors such as the amount of calories a person gets a day, their geographical location (e.g., whether or not they're located in a remote region of Alaska), the rate at which

information can be transferred through a particular medium, the effects of doing data entry for twelve hours a day, whether or not people have children, the waste output of travel, computing, how homes are heated, the way in which roads are laid out, whether or not roads are even present, the morphogenetic effects of particular diets, and many things besides completely fell off the radar. With the "materialist" turn in theory, matter somehow completely evaporated and we were instead left with nothing but language, culture, and discursivity.

The term materialism became so empty that Žižek could write, "[m]aterialism means that the reality I see is never 'whole' – not because a large part of it eludes me, but because it contains a stain, a blind spot, which indicates my inclusion in it" (Žižek 2006: 17). This is a peculiar proposition indeed. What need does matter have to be witnessed by anyone? What does a blind spot have to do with matter? Why is there no talk here of "stuff", "physicality", or material agencies? It would seem that among the defenders, materialism has become a *terme d'art* which has little to do with anything material. Materialism has come to mean simply that something is historical, socially constructed, involves cultural practices, and is contingent. It has nothing to do with processes that take place in the heart of stars, suffering from cancer, or transforming fossil fuels into greenhouse gases. We wonder where the materialism in materialism is.

We might attribute this to a mere difference in intellectual historical lineages – those descended from the Greek atomist Democritus on the one side and the critical theorists hailing from historical materialism on the other – but unfortunately, this perversion of materialism, this reduction to the cultural and discursive, has very real analytic and political effects. At the analytic level, it has had the effect of rendering *physical* agencies *invisible*. This arose, in part, from the influence of Marx's analysis – who was not himself guilty of what is today called "historical materialism" – of commodity fetishism, which showed how we relate to things under capitalism is, in *reality*, a relation between people or social (Marx 1990: 165). Marx was *right*. When a person buys a shirt, they are not merely buying a *thing*, but are rather participating in an entire network of social relations involving production, distribution, and consumption. However, somehow – contrary to Marx's own views – this thesis became the claim that things aren't *real*, or that they are merely crystallizations (Marx 1990: 128) of the *social*

and *cultural*. Based on this elementary schema of critical theory, the critical gesture became the demonstration that what we take to be a power of things is, in reality, a disguised instance of the economic, linguistic, or cultural. Everything became an alienated mirror of humans and the task became demonstrating that what we found in things was something that *we* put there. To speak of the powers of *things* themselves, to speak of them as producing effects beyond their status as vehicles for social relations, became the height of naïveté.

This placed us materialists in an uncomfortable position. On the one hand, we were supposed to be "hard-nosed materialists," believing that everything is physical, that the idea or concept doesn't determine the being of being as in the case of Hegel or Plato. Weren't we supposed to turn Hegel on his head? Didn't turning Hegel on his head entail showing that ideas issue from material relations, rather than material things issuing from ideas? On the other hand, our theorizations somehow led us to see discursivity, the concept, the social, the cultural, the ideological, text, and meaning – the *ideal* – as being the stuff that forms being. How had this happened? We went so far in our "historical materialism" that we even came to denounce all the findings of science and medicine as discursive social constructions (which isn't to say these practices shouldn't be subjected to ideological critique).

The analytic and political consequences of this were disastrous. Analytically we could only understand one half of how power and domination function. The historical materialists, critical theorists, structuralists, and post-structuralists taught us to discern how fashion exercises power and reinforces certain odious social relations by functioning as a vehicle for certain meanings, symbolic capital, and so on. Yet this is only part of the story. As Jane Bennett puts it, things have their power as well (see Bennett 2010). Unfortunately, discursivist orientations of social and political theory could not explain how things like turnstiles in subways, mountain ranges, and ocean currents also organize social relations and perpetuate forms of domination because they had already decided that things are only vehicles or carriers of social significations and relations. Because things had been erased, it became nearly impossible to investigate the efficacy of things in contributing to the form social relations take. An entire domain of power became invisible, and as a result we lost all sorts of opportunities for strategic intervention in producing emancipatory change. The

sole strategy for producing change became first revealing how we had discursively constructed some phenomenon, then revealing how it was contingent, and then showing why it was untenable. The idea of removing "turnstiles" as one way of producing change and emancipation wasn't even on the radar. This was a curious anti-dialectical gesture that somehow failed to simultaneously recognize the way in which non-human, non-signifying agencies, structure social relations as much as the discursive.

On the other hand, the shift from materialism to the discursivism of variants of historical materialism rendered it impossible to address one of the central political issues of our time: climate change. Thinking climate change requires thinking ecologically and thinking ecologically requires us to think how we are both embedded in a broader natural world and how non-human things have power and efficacy of their own. However, because we had either implicitly or explicitly chosen to reduce things to vehicles for human discursivity, it became impossible to theorize something like climate change because we only had culture as a category to work with. Having brought about the dissipation of the material in the fog of binary oppositions introduced by signs, there was no longer a place for thinking the real physical efficacy of fossil fuels, pollutants, automobiles, sunlight interacting with the albedo of the earth, and so on. Even among the ecotheorists in the humanities we find a preference for discussing portrayals of the environment in *literature* and *film*, rather than the role that bees play in agriculture and the system of relations upon which they depend.

I write these things with the fervor of the converted who was once himself in the historical materialist camp. Prior to 2006, before I had heard anything of speculative realism or object-oriented ontology, I was firmly entrenched in discursivism. Heavily entrenched in the work of Žižek, Lacan, Derrida, Adorno, and the structuralists and post-structuralists, I was entirely convinced that social relations are structured by language and culture, that the diacritical differences introduced by signs carve up the world, and that change was effected by debunking these signifying assemblages. I had read my Hjelmslev.

I was awoken from my dogmatic slumbers by, of all things – and I'm embarrassed to say – a computer game I played to gain some respite from the drudgery of marking in November of 2006: *SimCity 4*. This game shook my commitments to their core. For

those not familiar, *SimCity* is a simulation game where you build and design a city and watch it grow. However, it would be a mistake to conclude from the term "design" that you have complete control over how your city evolves. You make decisions as to how to zone different areas (residential, commercial, industrial, and so on), where to lay roads and power lines, where to place factories and power plants, whether or not to build museums and sports arenas, and so on. But the city grows of its own accord, attracting residents or not attracting residents, attracting businesses or not attracting businesses. If you lay out your roads wrong, traffic congestion occurs, your citizens get angry, and you lose the tax base that allows you to invest in other things. If you place your energy plant in the wrong place, pollution occurs, your citizens get angry and sick, and begin to leave and suffer health issues preventing them from working. If you forget to properly connect and add power lines, the business and industrial regions of your city fail to grow, and you're unable to attract new people to move into the residential districts because there are no jobs. You might choose to build a sports arena to make your citizens happy, but then they get angry about the increase in taxes and the congestion of traffic. On top of all this, there are periodic natural disasters to which you must respond.

What *SimCity* taught me is that the signifier, meaning, belief, and so on are not the sole agencies structuring social relations. Whether or not a commercial district grows as a function of the amount of energy available to that zone from the power plant is not a *signifying* or *cultural* difference. Whether or not people begin to die or move away as a result of pollution produced by garbage, coal-burning power plants, and industrial waste is not a signifying difference. Whether or not people vote you out of office because they're angry about traffic congestion is not the result of a signifier. To be sure, there are social relations here insofar as it is people that produce all these things and people that are flocking to this city, moving away, or voting you out of office, but the point is that the form the city takes is not, in these instances, the result of a signifier, a text, a belief, or narrative alone. It is the result of the real properties of roads, power lines, pollution, and so on.

As mundane and ridiculous as it sounds, I was startled by this encounter. My entire theory of social relations, power, and domination was threatened. Despite being mediated through something as apparently immaterial – in both senses of the term – as a

computer game, I had had an encounter with real materiality, with physical stuff, with things, and encountered the differences they make. This would be the seed that eventually led me to object-oriented ontology, the writing of *The Democracy of Objects* (Bryant 2011), and the idea of onto-cartography. The materialism that I defend in the pages that follow is unabashedly naïve. I do not seek to determine what matter in-itself might be. On the one hand, I believe this is a fool's errand insofar as philosophy, which works with concepts, does not have the tools to answer such questions. This is a question best left to physics and chemistry, and if history has been any indicator, whenever philosophers believe that they can provide a concept of the essence of matter, they have later been proven wrong. On the other hand, I am not convinced that matter is *one* type of thing. Rather, everything seems to point to the conclusion that there are many different types of matter. Similarly, I do not try to resolve esoteric questions such as the relationship between the qualitative and the quantitative. These abstractions, I believe, contribute to leading us to ignore matter, transforming it into a concept rather than recognizing it as a thing.

Rather, by "matter," all I mean is "stuff" and "things." The world, I contend, is composed entirely of "stuff" and "stuff" comes in a variety of different forms. Even ideas and concepts have their materiality. What this stuff might turn out to be is an open question. It might turn out to be various forms of energy, strings, fundamental particles, and so on. In describing my position as unabashedly naïve, I only mean to say that the world is composed of physical things such as trees, rocks, planets, stars, wombats, and automobiles, that thought and concepts only exist in brains, on paper, and in computer data banks, and that ideas can only be transmitted through physical media such as fiber optic cables, smoke signals, oxygen-rich atmospheres, and so on. I have given arguments elsewhere as to why I believe the only coherent ontology is one that recognizes the existence of discrete, emergent entities (see Bryant 2011: ch. 1), so I will not rehearse these demonstrations here. Rather, what follows begins with the premise that worlds are composed of units or individual entities existing at a variety of different levels of scale, and that are themselves composed of other entities. I call these entities "machines" to emphasize the manner in which entities dynamically *operate* on inputs producing outputs.

While a number of ontological and epistemological issues are

discussed, the main aim of what follows is social, political, and ethical. What *Onto-Cartography* attempts to analyze is the way in which relations between machines – at both the discursive and physical level – organize social or ecological relations. I say "social *or* ecological" because onto-cartography argues that societies are both particular types of ecologies and that they always open onto broader ecological relations with the natural world in which they're embedded. "Onto-cartography" – from "onto" meaning "thing" and "cartography" meaning "map" – is my name for a map of relations between machines that analyzes how these assemblages organize the movement, development, and becoming other machines in a world. In other words, onto-cartography attempts to account for why power functions as it does, why forms of social organization persist as they do and are resistant to change, why societies simply don't disintegrate as a result of entropy, and to devise strategies for changing oppressive social systems. The thesis of *Onto-Cartography* is that social relations or ecologies take the form they take due to the gravity – my term for "power" – physical and discursive machines exercise on elements that inhabit assemblages, worlds, or ecologies.

While onto-cartography overlaps with many issues and themes dealt with in geographical cartography, it differs from the latter in that geography, in one of its branches, maps geographical space, whereas onto-cartography maps relations or interactions between machines or entities and how they structure the movements and becomings of one another. With that said, onto-cartography does contend that geography is the queen of the social sciences as it is that branch of social theory that least dematerializes the world and social relations, avoiding the transformation of social ecologies into discursivity. If this is so, then it is because geography recognizes the manner in which social relations are always embedded in a particular space or place, that communication takes time to travel through space and requires media to travel, and that geographical features of the material world play an important role in the form that social relations take. Social and political philosophy needs to become more geographical.

While onto-cartography is critical of the tendency in social and political thought to reduce social relations to the discursive or semiotic, it does not proceed from the premise that these theories are mistaken or false when their scope is properly clarified. As Whitehead observes, philosophies seldom fail as a result of poor

reasoning or outright falsehood, but rather ". . . the chief error in philosophy is overstatement" (Whitehead 1978: 7). The problem with the thesis common among the critical theories that discursivity contributes to the structuration of reality in a variety of ways is not that it is false but that it is overstated. In light of this, in what follows I have attempted to develop a framework robust enough to integrate the discoveries of the critical theories, while also making room for a non-reductive account of the role played by physical media in the structuration of social relations.

While the aims of onto-cartography are political and ethical in nature, I do not advocate for any particular ethical or political paradigm in what follows. In other words, the work that follows can be described as a work of meta-politics and meta-ethics. It does not stipulate what political issues we should be concerned with, what we ought to do, or what ethics we ought to advocate, but rather attempts to outline the ontological framework within which political and ethical questions should be thought. Recently Adam Miller has proposed the concept of "porting" to describe this sort of theorizing (Miller 2013: 4–5). In computer programming, porting consists in reworking a program so it is able to function in a foreign software environment. It is my hope that a variety of political preoccupations – Marxist critiques of capitalism, anarchist critiques of authority and power, feminist critiques of patriarchy, deconstructive critiques of essences, critiques of ideology, queer theory critiques of heteronormativity, ecological critiques of environmental practices, post-humanist critiques of human exceptionalism, post-colonial critiques of racism, and so on – can be fruitfully ported into the framework of onto-cartography, assisting in the development of new avenues of inquiry and political practice, revealing blind-spots in other theoretical frameworks, and helping to render certain concepts and claims more precise and rigorous. The aim of onto-cartography is not to close of styles of inquiry, but to expand our possibilities for intervening in the world to produce change so as to better understand how power functions and devise strategies so as to overcome various forms of oppression.

Chapter Outline

Chapter 1 argues that worlds are composed entirely of machines, and broadly outlines the different types of machines that exist

(discursive, physical, organic, technological, and inorganic). Here I attempt to address criticisms likely to arise in response to the claim "that the world is composed entirely of machines" and I propose a post-human media ecology in which a medium is understood as any entity that contributes to the becoming of another entity affording and constraining possibilities of movement and interaction with other entities in the world. Chapter 2 develops the general ontology of machines. I argue that machines ought to be understood in terms of their operations, transforming inputs that flow through them, producing a variety of different types of outputs. Insofar as machines operate on flows, they are to be understood as "trans-corporeal" or interactively related to other machines through flows of information, matter, and material that they receive from other entities. In Chapter 3, I argue that we must engage in "alien phenomenology" to understand how machines interact with other entities in the world about them. As articulated by Ian Bogost (see Bogost 2012), an alien phenomenology is an observation of how another entity observes or interacts with the world about it. Finally, Chapter 4 argues that machines are assemblages of other machines, and argues that every machine faces the problem of entropy or potential disintegration. I argue that in order for machines to persist across time, they must engage in perpetual operations that allow them to maintain their organization.

Chapter 5 explores the structure of worlds. I argue that a number of different worlds exist and that worlds are ecologies of machines. Here I also investigate the relationship between expression (the realm of discursive or semiotic-machines) and the world of content (the realm of physical machines) and how they influence one another. The concepts of content and expression, drawn from Deleuze and Guattari, allows onto-cartography to retain the findings of the semiotically inclined critical theorists, while also remaining attentive to the power exercised by physical things. In Chapter 6, I explore the structure of time and space as understood within an onto-cartographical framework. I reject the Newtonian conception of space as an empty milieu containing entities where motion is possible in all directions, instead arguing for a topological conception of space composed of paths – themselves composed of machines – between machines the determine what is related to what and the vector along which an entity must move to reach a particular destination. I argue that the topological structure of paths plays a key role in how power is organized

within assemblages. Similarly, I argue for a pluralistic concept of time where time is understood as the rate at which a machine can receive inputs from other machines and carry out operations. Here I explore issues that arise when machines with different temporal structures interact with one another, complicate notions of historicity common among historical materialists and new historicists, and explore energy-related themes such as fatigue and information saturation. I attempt to demonstrate that thermodynamic and temporal issues play an important role in how power is structured and why certain oppressive social ecologies persist. I conclude this chapter by arguing that the form most social relations take result from a variety of different causes or overdetermination and that we need to be attentive to this distributed causality to properly understand social assemblages.

In Chapter 7 I address questions of agency and structure in social assemblages. Drawing, by analogy and metaphor, on Einstein's theory of relativity, I argue that social assemblages are held together not by "social forces," but by the manner in which machines structure the spatio-temporal paths along which other entities move, become, and develop. I refer to the way in which semiotic and physical machines curve the space-time of other entities as "gravity," my proposed replacement term for the concept of "power" common in social and political theory. The advantage of the term "gravity" is that it helps us to overcome the anthropocentric connotations of "power," drawing attention to the way in which non-human machines such as plants, animals, bacteria, technologies, infrastructure, and geographical features also contribute to the form that social assemblages take. Here I distinguish between the different types of objects that "gravitationally" structure ecologies – dark objects, bright objects, satellites, dim objects, rogue objects, and black holes – and distinguish between subjects and agents. I argue that agency comes in a variety of degrees ranging from that found in the humble bacteria all the way up to the sort of agency exercised by institutions and states, and argue that "subject" ought to be understood as a *functional* term that can be transitorily occupied by humans and non-humans alike, living and non-living beings alike. Drawing on Serres's concept of "quasi-objects," a subject, I argue, is an operator that *subjects* or that quilts or draws other machines together in an assemblage.

Chapter 8 outlines a geophilosophical framework for social and political thought. Geophilosophy argues that only the material

and natural world exists, that societies and cultures are assemblages within the natural and material world, that the broader natural world plays a key role in how social assemblages come to be organized, that there is no social assemblage that doesn't draw on material flows for energy to resist entropy, and that causally the form socially assemblages take is overdetermined by a variety of different machines. Drawing on the resources of developmental systems theory (DST), I argue for a model of development that investigates the form entities take in terms of bidirectional causality involving genes, environment, and the active participation of the organism itself in the construction of itself. Not only does DST provide us with a nice example of analysis sensitive to overdetermination, but it also reflects a path beyond problems we encounter in sociology and critical theory. Gene-centric biologists tend to treat the organism as a mere *effect* of unilateral causality through genes or to treat the organism as an effect of a combination of the genes and the environment. The organism itself is here reduced to an effect and doesn't play an active role in its own formation or construction. A similar framework is reflected in critical theories – especially of the Marxist variety – where agents are often treated as a mere effect of conditions and relations of production. DST argues that the organism plays a role in its own formation, development, or construction through the selective relations it entertains to its environment and the way in which it constructs its own niches. As such, it provides fruitful paths for thinking beyond the crisis of agency that arises from a tendency to reduce agents to effects of "scene" or environment.

The chapter closes with a discussion of the three dimensions of geophilosophy: cartography, deconstruction, and terraformation. Cartography is the mapping of interactions and relations between machines composing assemblages or ecologies. Here I propose four types of maps – cartographical maps, genetic maps, vector maps, and modal maps – and argue that political practice requires good maps of assemblages in order to effectively intervene in worlds to produce more just, equitable, sustainable, and satisfying assemblages or ecologies. Deconstruction consists in the traditional deconstructions we find in the various critical theories, as well as the active severing of oppressive relations in the material world. I argue that in order to change the world it is often necessary to deconstruct relations between machines at the level of expression and content. Finally, terraformation consists in the

construction or building of alternatives that would allow people to escape the oppressive circumstances in which they live. Here I argue that while critical theory has done a good job at deconstructing oppressive machines at the level of the plane of expression or semiotic-machines, many oppressive relations result not from people having mistaken ideological beliefs, but from living in material circumstances that provide no alternative. We need to do a better job, I believe, at actively constructing alternatives allowing people to escape circumstances. For example, people might readily recognize that dominant agricultural practices contribute greatly to the destruction of the environment and climate change, but lack alternatives for food. Terraformation here would consist in building assemblages of locally grown food in environmentally friendly ways that would provide people with alternatives.
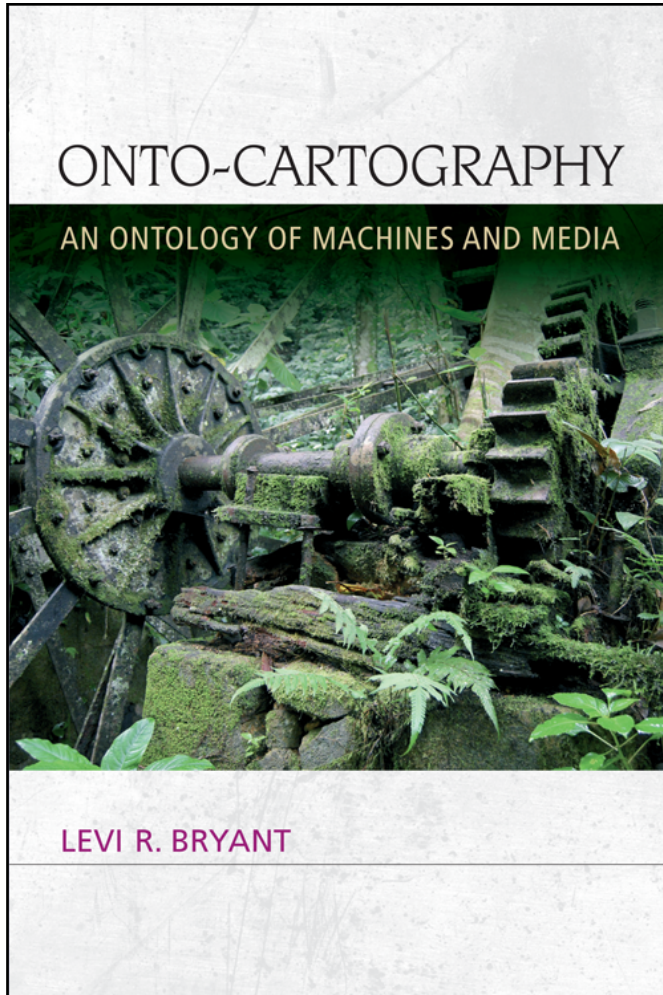
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