The Gravity of Things
An Introduction to Onto-Cartography

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ABSTRACT

Bryant's machine-oriented ontology has been increasingly seductive for anarchist philosophers because of its ability to think through the autonomous dimension of objects and the way in which things influence social and political relations. In this article, Bryant explores the way in which semiotic and physical objects contribute to the form social relations take, playing a key role in the movement and becoming of humans and collectives. Through analogy to Einstein's theory of relativity, Bryant proposes the concept of "gravity"—roughly equivalent to the concept of power in sociology—to denote how semiotic and material entities influence the becoming and movement of subjects and collectives in time and space. As a consequence, political questions of emancipation and resistance are argued to be intimately related to questions of social time and space, and the question of the political becomes that of how we might achieve speeds required for attaining escape velocity with respect to oppressive gravitational fields or social assemblages

In the year of 1916, Einstein proposed his general theory of relativity. The general theory of relativity was put forward to explain the phenomenon of gravity. In *Principia Mathematica*, Newton had discovered much about how gravity *functions*, yet the *mechanism* of gravity remained entirely mysterious. Indeed, within the Newtonian framework we weren't to ask questions about *how* gravity functions at all. It was enough that Newtonian theory

could make accurate predictions about the movement of planets, comets, moons, etc. It was enough that it allowed us to get our cannon balls where we wanted them. How gravity was able to affect objects in this way was set aside as a question in the euphoria of the new predictability occasioned by these simple equations, these few letters and symbols, which now allowed us to predict the movement of objects.

The problem was simple. Naturalistic and materialist thought has always argued that in order for a causal interaction to occur between two entities, there must be a *direct* interaction. One entity must touch the other to affect in it any way. In a masterpiece that was nearly destroyed by the Roman elite and Christian church,[1] the great Roman poet-philosopher Lucretius gives voice to this principle: "Our starting-point shall be this principle: *Nothing at all is ever born from nothing.*"[2] Lucretius's thesis was that in order for one entity to affect another there has to be a real material interaction between the two beings. With this axiom he challenged all superstition and broached the possibility of a rigorous science of causes. If Lucretius's first axiom was so anathema to all superstition, then this is because it undermined the idea of magic or action at a distance. For example, within a Lucretian framework a spell or curse cast against another person in the absence of that person could have no effect because there is no material interaction between the enunciation of the hex and the person. You cannot step on a crack and break your mother's back.

It is on the basis of a thesis such as Lucretius's first axiom that Newton's theory of gravity was so disturbing. For, like absurd beliefs such as the idea that you can step on a crack and break your mother's back, Newton's gravity appeared *occult*. How is Newton's thesis that the moon and sun are responsible for the tides any different than the idea that somehow a prayer at a distance can heal a person? How is it possible for one entity to affect another without the two touching in some way or another? Newtonians appealed to the concept of force to account for gravity, but it was difficult to see how force could be anything but an occult or magical agency insofar as no one could see how one thing

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[1] For a discussion of the ill-fated history of Lucretius's *De Rerum Natura* and its amazing rediscovery, see Stephen Greenblatt, *The Swerve: How the World Became Modern* (New York: W.W. Norton, 2011).

[2] Lucretius, *The Way Things Are: The De Rerum Natura of Titus Lucretius Carus*, trans. Rolfe Humphries (Bloomington: Indiana University Press, 1969), 24.

could exercise force on another from a distance. How can one entity act on another without touching that entity?

It was in the context of questions such as these that Einstein's general theory of relativity constituted such a revolutionary leap forward. While Einstein, like Newton, did not yet provide a mechanism for gravity—we are only now beginning to unlock the mechanism of gravity through the discovery of the Higgs boson—he did go a long way towards demystifying the phenomenon of gravity by freeing it from the concept of force. Indeed, what Einstein showed is that gravity is not a force at all, but is rather a curvature of space-time produced by the mass of objects. Within the Einsteinian framework, gravity is not a force that *attracts* and *repels* other objects, but rather is an *effect* of how the mass of objects curves space-time. The moon orbits around the earth not because it is simultaneously attracted and repelled from the earth, but rather because the mass of the earth curves space-time, creating a *path* that the moon follows in its movement along a straight line; a line that is straight along the surface of a curve. To visualize this, imagine a bed sheet upon which a cantaloupe has been placed. The cantaloupe curves the surface of the sheet in such a way that if an orange is placed in the field of that curvature it will follow that path as it rolls along the sheet. Gravity is not a force, but is rather a field or a topology that other objects follow in their movement.

Within the framework of Machine-Oriented Ontology (MOO), Einstein's theory of gravity is of the greatest importance for two reasons. First, Einstein shows that space-time is not an indifferent milieu that is a given container in which entities are housed. In other words, space-time is not something in which entities are contained. Rather, space-time *arises* from the mass of objects or machines. Space-time doesn't pre-exist things, but rather arises from things. Second, Einstein shows that space-time is not homogeneous. The flow of time and the metric of space is not the same in all places. Rather, space-time has all sorts of lumps, contractions, dilations, and curvatures that differ from region to region. There are even space-times that are so powerfully curved that nothing can escape from them (for example, black holes), thus effectively rendering them self-contained space-times detached from other space-times. Einstein's thesis is that there isn't space-time, but rather *space-times*. Gravity is not a force of attraction and repulsion, but consists rather of space-time paths. As we will see, paths are both paths of becoming and paths of movement. Paths are those vectors that objects must follow in their move-

ment from one place to another and in their development or be-coming.

I begin with Einstein's general theory of relativity and theory of gravity because it provides us with a helpful analogy for un-derstanding the basic theoretical claims of onto-cartography. On-to-cartography is both a theory of the space-time of objects as they interact and a method for mapping these interactions. To be sure, "gravity," as I am using the term here is a metaphor—or, more optimistically, a philosophical concept in Deleuze's sense of the word[3]—chosen to draw attention to how things and signs structure spatio-temporal relations or paths along which entities move and become. In terms more familiar within currently exist-ing theory, we could refer to "gravity" as "force" or "power." If, however, I have chosen to speak of gravity rather than power, then this is because the concept of power within the world of philosophy and theory has come to be too anthropocentric, im-mediately drawing attention to sovereigns exercising power, class power, symbolic power, and things such as micro-power and bi-opower. While I have no wish to abandon forms of analysis such as those found in Marx, Foucault, and Bourdieu, the manner in which these anthropological connotations have become sedi-mented within the institutions that house the humanities, both at the level of training and scholarship—itself a form of gravity—have rendered it difficult to imagine nonhuman things exercising power as anything more than blank screens upon which humans project their intentions and meanings. As Stacy Alaimo has writ-ten, "[m]atter, the vast stuff of the world and of ourselves, has been subdivided into manageable 'bits' or flattened into a 'blank slate' for human inscription."[4] By far, the dominant tendency of contemporary critical theory or social and political theory is to see nonhuman entities as but blank slates upon which humans project meanings. Things are reduced to mere carriers or vehicles of human power and meaning, without any serious attention de-voted to the differences that nonhumans contribute to social as-semblages. While I have no desire to abandon more traditional semiotically driven forms of critical analysis insofar as I believe they have made tremendous contributions to our understanding of why our social worlds are organized as they are, it is my hope

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[3] See Gilles Deleuze and Felix Guattari, *What is Philosophy?*, trans. Hugh Tomlinson and Graham Burchell (New York: Columbia University Press, 1994).

[4] Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010), 1.

that the term "gravity" will be foreign enough to break old, familiar habits of thought, to overcome a certain blindness at the heart of much contemporary theory, providing us with a far richer understanding of why social relations take the form they take, thereby expanding the possibilities of our political interventions.

The "onto" of "onto-cartography" refers to the word "ontic," from the Greek ὄντος, denoting materially existing entities, substances, or objects. "Cartography," of course, is the practice of constructing or drawing maps. An onto-cartography would thus be a map or diagram of things—and more precisely things and signs—that exist within a field, situation, or world. By "situation" or "world" I mean an ordered set of entities and signs that interact with one another. A world or situation is not something other than the externally related entities and signs within it, but is identical to these entities and signs. Onto-cartography is thus not a map of space or geography—though we can refer to a "space of things and signs" in a given situation or field and it does help to underline the profound relevance of geography to this project insofar as onto-cartographies are always geographically situated —but is rather a map of things or what I call machines. In particular, an onto-cartography is a map of the spatio-temporal gravitational fields produced by things and signs and how these fields constrain and afford possibilities of movement and becoming.

But towards what end? When we do an onto-cartography are we merely making a *list* of things and signs that exist? A list is an inventory of entities that exist within a situation, but is not yet a map or cartography. Rather, in order for something to count as a cartography, it must show how things are distributed and related to one another rather than merely enumerating or listing them. In particular, a central thesis of onto-cartography is that space-time arises from things and signs. Onto-cartography is thus the practice of mapping the spatio-temporal paths, the gravitational fields, that arise from interactions among things. Central to this project is the recognition that things and signs produce gravity that influences the movement and becoming of other entities. This gravity is not, of course, the gravity of the physicists— though it would include that sort of gravity as well—but is a far broader type of gravity that influences the movements and becomings of all entities. With Einstein, onto-cartography argues that the gravities of things and signs produce spatio-temporal paths along which entities are both afforded certain possibilities of movement and becoming and where their possibilities of movement and becoming are constrained. Further, with Einstein,

onto-cartography rejects the notion that there is one space-time that contains all entities, instead arguing that there are a variety of space-times arising from the gravity exercised by entities in a milieu or situation.

While the term "onto-cartography" is perhaps new, bits and pieces of onto-cartographical theory and investigation have been around for quite some time. When Latour writes "Where are the Missing Masses" and argues that we must refer to nonhumans such as hinges on doors and speed bumps to account for many of the regularities we find in society, he is proposing what we would call an onto-cartographical analysis of the world.[5] There Latour shows us how the nonhumans of the world in the form of various technologies encourage us to behave in certain ways or follow certain paths that we would not ordinarily follow in their absence. He shows, in short, how these nonhumans exercise a certain gravity over us, leading us to follow certain paths of movement and becoming.

In the first volume of *Civilization & Capitalism*, the historian Braudel proposes to draw up "an inventory of the possible"[6] defined by both the inherited habits of a particular group of people at a particular point in time and the material conditions of that time. As Braudel writes,

> Can it not be said that there is a limit, a ceiling which restricts all human life, containing it within a frontier of varying outline, one which is hard to reach and harder still to cross? This is the border which in every age, even our own, separates the possible from the impossible, what can be done with a little effort from what cannot be done at all. In the past, the borderline was imposed by inadequate food supplies, a population that was too big or too small for its resources, low productivity of labour, and the as yet slow progress of controlling nature.[7]

The inventory of the possible that Braudel here refers to is not

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[5] Bruno Latour, "Where are the Missing Masses? The Sociology of a Few Mundane Artifacts," in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* ed. Wiebe E. Bijker and John Law (Cambridge: MIT Press, 1992).

[6] Fernand Braudel, *The Structure of Everyday Life: Civilization & Capitalism, 15th–18th Century, Volume I,* trans. Sian Reynolds (New York: Harper & Row, 1981), 28.

[7] Braudel, *The Structure of Everyday Life*, 27.

that of logical or formal possibility where we wonder after the manner of Quine, for example, how many possible people might be standing in an empty doorway or whether pigs can fly; but is that of *material* possibility. Material possibility consists of what is *really* possible within a particular milieu or situation, given the material structuration of that milieu in terms of resources available, existing technologies, properties of things that populate the milieu, etc. What, Braudel wishes to know, is materially possible within a particular historical milieu or situation?

To understand these structures of material possibility, take the example of the city of Cologne as it existed in the 15th century. Braudel notes that with a population of 20,000 people, Cologne was one of the largest cities in all of Europe. But why was this city, at this time, unable to expand beyond this size? As Braudel notes, in order to sustain this population,

> [i]t needed every available flock of sheep from the Balkans to support it, rice, beans and corn from Egypt, corn and wood from the Black Sea; and oxen, camels and horses from Asia Minor. It also required every available man from the Empire to renew its population in addition to the slaves brought back from Russia after Tartar raids or from the Mediterranean coasts by Turkish fleets.[8]

A city is not merely an entity, a thing that sits there, but is rather a machine or organism that faces the problem of how to produce and maintain the elements that belong to it (citizens, occupations, social order, buildings, goods, etc.) and to produce the things that also grow out of it through the processes or activities that take place within it. To be precise, a city is a "dissipative structure" that is only able to maintain its organization or structure through flows of energy passing through it.[9] In order for the Cologne of the 15th century to maintain its existence and stave off entropy or dissolution, it required flows of energy in the form of wood for building and fuel, food of all sorts to sustain its population (every human body, occupation, and social grouping re-

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[8] Braudel, *The Structure of Everyday Life*, 52.

[9] For a discussion of dissipative, compare with Ilya Priogogine and Isabelle Stengers, *Order Out of Chaos: Man's New Dialogue With Nature* (New York: Bantam Books, 1984), sec. 5.3. For an excellent discussion of far-from-equilibrium systems, cf. Jeffrey A. Bell, *Philosophy at the Edge of Chaos: Gilles Deleuze and the Philosophy of Difference* (Toronto: University of Toronto Press, 2006), chap. 6.

quires a certain number of calories to be possible), labor to carry out the various functions of the city, and so on. These things, in their turn, were dependent on currently existing agricultural technologies, the presence or absence of roads between regions of the countryside and other cities that would allow food and other goods to be transported, existing maritime technologies and how much ships could carry, existing storage techniques allowing food to be preserved, medical and sewage technologies preventing disease and epidemics, possibilities of communication between regions remote from one another, population densities in the surrounding region providing sources of labor, and a host of other things. We can refer to all of these required elements as "infrastructure." While not the sole cause of the form that the city of Cologne took during the 15th century, this historically specific infrastructure did afford and constrain the possibilities of the city in all sorts of ways.

The infrastructure in which the Cologne of the 15th century was embedded formed a massive gravitational field defining spatio-temporal paths along which becoming and movement was structured. Let us take a few examples to illustrate this point. Currently existing storage and preservation techniques placed limits on how much food could be stored to provide for the population of the city, what sorts of foods could be stored, as well as what it was possible to ship to the city over land or water to the city. At the level of the temporal, this had a tremendous impact on what size the city could reach as well as the health and development of the people of the city. On the one hand, the city could only reach a certain population density or size because it only had so much food to go around. The countryside could only produce so much food to feed its citizens and itself required a requisitely large labor force to produce that food. The properties of food along with then-existing storage and food preservation technologies, as well as existing agricultural technologies in the form of cultivation and pesticides and existing transportation technologies, insured that food sources could only be transported from particular distances, and even then only foods of particular sorts, lest the food spoil and become useless. Today, for example, we scarcely recognize what a luxury oranges in the winter are. Temporally, of course, this entailed that the development of human bodies was seasonally dependent on what was available, and that it was highly susceptible to the ravages of drought and pestilence because food could not be shipped in from elsewhere under these circumstances. This could not help but have an impact on

the health of bodies, how they develop, the longevity of lives, etc.; that is, these things affect all those things that pertain to the becoming of bodies or their qualitative properties. We are often struck when we look at the uniforms of French and American revolutionary soldiers in museums, noting just how diminutive these people were. Have humans evolved to become tall giants? Not at all. What has changed is not the genes of humans but the availability of nutrients in abundance throughout the year, such as greens, milk, proteins, and so on. These changes have been made possible as a result of transformations in agricultural technologies, transportation technologies, storage and preservation technologies, and even communication technologies. If communications technologies prove so pivotal, then this is because different regions of the world must communicate to signal to each other what foodstuffs are required by one region or the other. The shift from communications carried on horseback by a courier over regions of the world lacking roads to communications by satellite technologies is not a difference in degree but a difference in kind, fundamentally transforming social relations and what is possible for a group of people. It is not simply—as is oft noted—that now ideas can circulate much more quickly and pervasively, but also that simple things like signaling the need for particular foods across vast distances between different climatological zones is now possible. Nor do these variations in food availability simply affect the physical body. As anyone knows who goes a day or two without food or only eating food of a particular sort, what we eat and whether we eat has a profound impact on our cognition, our ability to think at all, as well as our emotions. Famine does not simply destroy bodily health, but generates emotional states and social relations of a particular sort that can be catastrophic to any social order.

All of these things are differences contributed not by signs, not by signifying differences, but by the properties of things themselves: the properties of cultivation techniques and the tools used, the properties of water, the properties of grains and animals, the properties of communication techniques, the properties of waste and microbes, the properties of boats and horses, etc. Once we begin to discern this power of things, the way in which they bend or curve time and space, we can discern contributions to onto-cartographical theory all over the place. We see it in Marshall McLuhan's thesis that media are an extension of humans.[10]

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[10] Marshall and Eric McLuhan, *Laws of Media: The New Science* (Toronto: University of Toronto Press, 1992).

Indeed, we could say that onto-cartography is a media theory in the tradition of McLuhan. We see it in Andy Clark's extended mind hypothesis, where it is argued that mind is not something inside the head, but is instead a relation between body, brain, and, above all, the tools we use when navigating the world.[11] We see elements of a theory of onto-cartography in Friedrich Kittler's analysis of how various communications technologies affect and transform social relations.[12]

We see other elements in Walter Ong's analysis of how writing transformed the nature of cognition, rendering things such as mathematics and "universal" law possible.[13] We see it in DeLanda's assemblage theory of society and materialist accounts of world history.[14] We see it in Marx's analysis of the impact of the factory and rigid machines on working life and the bodies and minds of workers. We see it in Sartre's analysis of how the "practico-inert" takes on a life of its own structuring the lives of people.[15] We see it in Stacy Alaimo's account of trans-corporeality or how bodies are enmeshed in one another.[16] We see it in Lacan's analysis of Poe's "The Purloined Letter," where a letter determines the position of an agent within a social network irregardless of that agent's intentions, meanings, beliefs, or thoughts. Here too there is gravity, a gravity exercised by signs and texts. Similarly, we see it in David Graeber's analysis of debt, another semiotic entity, and how it structures lives and social relations.[17] We also see elements of such a theory in Judith Butler's *Gender Trouble*, where it is argued that gender is not an intrinsic feature of human bodies but rather results from the performance of human bodies based on discourses.[18] What we lack is not elements

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[11] Andy Clark, *Supersizing the Mind: Embodiment, Action, and Cognitive Extension* (Oxford: Oxford University Press, 2010).

[12] Friedrich A. Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999).

[13] Walter J. Ong, *Orality & Literacy* (New York: Routledge, 2002).

[14] Manuel DeLanda, *A Thousand Years of Nonlinear History* (New York: The MIT Press, 2000).

[15] Jean-Paul Sartre, *Critique of Dialectical Reason: Volume 1*, trans. Alan Sheridan-Smith, (New York: Verso, 2004).

[16] Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material Self* (Bloomington: Indiana University Press, 2010).

[17] David Graeber, *Debt: The First 5,000 Years* (Brooklyn: Melville House, 2011).

[18] Judith Butler, *Gender Trouble: Feminism and the Subversion of Identity* (New York: Routledge, 2006).

of a theory, but a unified theory that's able to pull all of this to-
gether. Instead we get competing camps that situate these discov-
eries as oppositions, as conflicts of interpretation, rather than as
contributions to a generalized theory.

There is both a theory and an empirical practice of onto-
cartography. The practice of onto-cartography is simply the anal-
ysis or mapping of spatio-temporal gravitational paths produced
by various things and signs in a given situation or world. If this
practice must be empirical, then this is because nothing allows us
to decide in advance what entities and semiotic beings inhabit a
situation, how they interact, what paths they produce, how they
behave in this particular context or environment, and so on. The
project of onto-cartography is massive and likely not to be the
work of any one person because it is profoundly multi-disci-
plinary, requiring knowledge of the natures of the things that
inhabit the situation, their specific properties, literature, mythol-
ogy, semiotics, political theory, history, various sciences, technol-
ogies, etc. The difficulty of this practice is further exacerbated by
the fact that many things crucial to understanding the gravita-
tional field of a situation never make it into texts or the archive;
at least, the archive that people in the humanities tend to be fa-
miliar with. How people prepare and cultivate food, sanitation
structures, the details of power grids, the technologies available,
disease epidemiologies, the distribution of texts throughout the
world, the layout of roads, etc., are not things that we normally
attend to in our analyses of why societies take the form that they
take, nor are they things that tend to appear in the texts or ar-
chive we tend to consult to capture traces of the social world. As
a consequence, they tend to become invisible even though they
exercise crucial gravitational forces on people and play a central
role in explaining why certain forms of oppressive social organi-
zation persist. As Latour notes throughout his work, this system-
atically leads to the impression that societies are held together
merely by beliefs, laws, norms, signifying systems, discourses. It
is not that these things are not necessary components of certain
types of societies—and here I follow Whitehead in treating a soci-
ety as any assemblage of entities, regardless of whether humans
or living beings are involved[19]—but that societies also take the
form they take because of vast networks of nonhuman entities
and the gravity they exercise over other entities within that mi-
lieu. This dimension of social relations often goes unrecognized

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[19] See Alfred North Whitehead, *Process and Reality* (New York: The Free
Press, 1978), 83–109.

because, on the one hand, it tends to function well (thereby becoming invisible), while on the other hand, it goes unremarked in much of the archive we tend to consult in our critical social and political investigations. It is not until there is a massive power outage such as the one discussed by Bennett in *Vibrant Matter*, or something like Hurricane Katrina comes along shutting down entire cities that we become aware of just how central a role nonhumans have in maintaining certain types of social relations.[20]

A theory of onto-cartography, by contrast, lays out the basic concepts of onto-cartography and how they interrelate. Without being exhaustive, these basic concepts are concepts such as object, gravity, path, becoming, movement, world, pluralistic spatio-temporality, relation, sign, etc. Additionally, onto-cartography outlines the constraints on interactions between entities. In particular, with Lucretius, onto-cartography endorses the thesis that "nothing can come from nothing." There is no action at a distance. For one entity to affect another, there must be a direct interaction between them. There must be some medium through which they come to be related to one another. There must be some material mediator or daimon that passes between the one entity and the other. If current physics is right—and so far it seems to be holding up—then it follows that no two entities can interact at rates that exceed the speed of light. This entails that wherever interactions at a distance take place, time will be a factor insofar as it takes time for the daimon, signal, or simulacrum to travel from one entity to another. Since the mediums through which most simulacra travel is far slower than the speed of light, these temporal rates will exercise profound gravity on a variety of different entities. Think, for example, of all the ways in which communication about vital matters with a government bureaucracy can affect our lives. Time and speed play a crucial role in the forms that social relations take.

This emphasis on the materiality of transmissions or messages between entities, along with the time it takes for these simulacra to travel, leads us to think about signs, texts, and representations differently. Our tendency is to focus on the *aboutness* of signs, texts, representations, and messages, forgetting that these simulacra are not simply about something, they *are* something. As a consequence, the material reality of signs becomes invisible or forgotten. The situation with signs is similar to what Heidegger

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[20] See Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), chap. 2.

discusses with respect to Dasein's experience of spatiality and a pair of spectacles. As Heidegger writes,

> [w]hen . . . a man wears a pair of spectacles which are so close to him distantly that they are 'sitting on his nose', they are environmentally more remote from him than the picture on the opposite wall.[21]

As Heidegger observes, in our comportment towards the picture, our glasses become invisible, withdrawing from presence, insofar as we are directed towards the painting. Heidegger wishes to argue that this demonstrates that there is a more fundamental spatiality than that of Euclidean or Newtonian space, where proximity is defined not by metric closeness, but rather by our concernful dealings with the world around us. In these concernful dealings, we look *through* our glasses. What is close in lived experience is not the glasses, but rather the picture we are regarding in our concernful dealings. Yet if theorists such as Andy Clark are right with their extended mind hypothesis, a near-sighted person wouldn't even be able to comport towards the picture at all without his body entering into a coupling with the spectacles.

The situation is the same with signs, texts, and messages. Signs draw our thought beyond the vehicle that carries them—the signifier through which they are transported—to whatever signified they might be about. What we forget in our dealings with signs—and what Heidegger forgets when he talks about the spectacles—is that in order for signs to refer to something beyond themselves in the first place, it is necessary for signs to themselves be material entities that are present. In other words, like any other entity, signs must be material entities that travel through time and space and that are limited by time and space. Signs always require some medium in which to exist. This medium can be the air through which they travel, for sounds cannot travel through a void. They can be inscribed on paper, in computer data banks, in brains, in smoke signals, flags, skywriting, etc. They can be inscribed in a variety of different forms of writing ranging from computer code to cuneiform. However, even if the sense of a sign is itself incorporeal as Deleuze and Guattari argue,[22] signs are nonetheless always attached to what Peirce called

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[21] Martin Heidegger, *Being and Time,* trans. John Macquarrie and Edward Robinson (San Francisco: Harper San Francisco, 1962), 141.

[22] Gilles Deleuze and Felix Guattari, "Postulates of Linguistics," in *A Thousand Plateaus: Capitalism and Schizophrenia,* trans. Brian Massumi

a "sign-vehicle" or some sort of material medium that transports them.

This might appear to be a minor, obvious point, but I believe it has tremendous implications. What we need is a sort of inverted transcendental ἐποχή, that for the moment suspends any focus on the sense of signifying entities, instead attending solely to their material or embodied being. This would entail that like the distribution of a virus or microbe in a particular environment, signs also have an epidemiological distribution in the world, a geography of where they are located in the world. Because every text requires a material embodiment in order to travel throughout the world, they will be located in particular times and places. To see why this is important take projects such as critiques of ideology. Critiques of ideology tend to focus on the incorporeal dimension of cultural artifacts and practices—their meaning or sense—ignoring the material distribution of ideologies. While I do not doubt the veracity of many of these critiques, the problem is that in focusing on the incorporeal dimension of ideological texts, their sense or meaning, these critiques behave as if these ideologies exist everywhere. Yet different places have different ideologies because ideologies, like anything else, are spatio-temporally situated entities. Just as we wouldn't want to spray a pesticide for West Nile Virus in an area where West Nile Virus doesn't exist, it is a waste of time and effort to critique an ideology when it doesn't exist in this particular place. We need means of identifying *where* the signifying constellations are and of discerning ways of intervening in those particular signifying constellations.

Attentiveness to signifying entities always raises questions about just who ideological interventions are for. While I don't share a number of his meta-theoretical claims, I think many of Žižek's ideological critiques are on target. Aping Žižek's style, the question to ask, however, is that of precisely *who* these critiques are for. We would imagine that Žižek's critiques are directed at those who labor under these ideologies. After all, it wouldn't make much sense to critique an ideology if it wasn't directed at changing those who labor under that ideology. Yet when we reflect on Žižek's critiques, we notice that they require a high degree of theoretical background to be understood, requiring acquaintance with Lacan, Hegel, and a host of other theorists. Every entity requires a sort of "program" to receive and decipher messages of a particular sort from another entity. Reading Žižek's work requires a particular sort of training if the recipient is to

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(Minneapolis: University of Minnesota Press, 1987).

decipher it. When we evaluate Žižek's work by this criteria and critique him immanently—clearly he endorses the Marxist project of not simply representing the world but of changing it—we can ask, on *material* grounds, about the adequacy of his project. Such a critique is not a critique of the accuracy of his critiques, but rather of the adequacy of his practice. It is a question that only comes into relief when we evaluate the material properties of texts, the entities to which they're addressed, and the adequacy of how these texts are composed. When judged by these criteria, we might conclude that such critiques are not addressed at those laboring under such ideologies at all, but rather at others that possess the requisite programs to decipher these sendings. We might thereby conclude that such a practice is actually a mechanism that reproduces these sorts of social relations rather than transforming them as it leaves the ideology itself untouched while simultaneously giving the ideological critic the impression that he's intervening in some way. Note, this critique has nothing to do with the accuracy and truth of these critiques—in many instances, they're quite true—but with how they materially function. Such an analysis would then not dismiss these ideological critiques, but would instead ask what additional operations must be engaged in to insure that the critiques reach their proper destination and produce effects within those networks.

Temporarily suspending our focus on meaning or content, an attentiveness to sign-vehicles would lead us to approach semiotic entities in much the same way as we approach disease epidemiology or population growth and diffusion. Here there are obvious cross-overs between how onto-cartography approaches the materiality of semiotic entities and meme theory.[23] Such an analysis would be particularly attentive to how various mediums of transmission or carriers of sign-vehicles (air, written text, internet, etc.) influence meaning and social relations, how various forms of inscription influence messages, and how sign-vehicles affect people, etc. Here, for example, we might think of Benedict Anderson's analysis of the role that newspapers played in forming national identities.[24] While the content of these newspapers, their *aboutness*, certainly played a crucial role in the formation of national identities, the sheer materiality of the newspaper as a

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[23] For a discussion of memes, see Daniel C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (New York: Simon and Schuster, 1995), chap. 12.
[24] Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (New York: Verso, 2006).

medium played a central role. If this is the case, then it is because the newspaper allowed particular messages or forms of expression to circulate broadly, providing a platform to engage in shared identifications despite the fact that these people had no direct contact or communication with one another due to being at vast distances from one another. As McLuhan liked to say, the medium, in its sheer materiality, is the message.

The project of onto-cartography arises from issues arising out of my concept of regimes of attraction. In *The Democracy of Objects* I introduced the concept of "regimes of attraction" to account for why objects are individuated as they are.[25] There I argued that objects, which I now call machines, are split between a virtual dimension that I refer to as "virtual proper being" and another dimension I refer to as "local manifestation."[26] Drawing on Deleuze and Guattari as well as autopoietic theory, I thematize a machine as an entity through which flows of matter or energy pass, reworking and being reworked by that matter as it operates upon it, producing some sort of output. The central feature of a machine is that it operates or functions, producing either its own parts or some sort of product through its operations. Machines are always internally heterogeneous, being composed of a variety of parts or smaller machines that are coupled with one another, and perpetually face the threat of entropy or dissolution over the course of their existence. Machines are not so much brute clods that sit there, but rather are processes or activities. Take the example of a machine such as a tree. A tree is a machine through which flows of matter such as sunlight, water, nutrients in the soil, carbon dioxide, etc., pass. Indeed, in order for a tree to continue to exist rather than dissolve or fall apart (die and rot), it must continuously draw on these flows. In drawing on these flows, the tree reworks them, producing its parts out of sunlight, soil nutrients, carbon dioxide, water and forming these matters into various types of cells, but also the fruit that will fall from the tree, oxygen, and other outputs. As Deleuze poetically puts it,

> What we call wheat is a contraction of the earth and humidity, and this contraction is both a contemplation and

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[25] Levi R. Bryant, *The Democracy of Objects* (Ann Arbor: Open Humanities Press, 2011), chap. 5.

[26] For a discussion of machines, see Levi R. Bryant, "Machine-Oriented Ontology: Towards a Pan-Mechanism" at *Larval Subjects*, June 21, 2012: http://larvalsubjects.wordpress.com/2012/06/21/machine-oriented-ontology-towards-a-pan-mechanism.

the auto-satisfaction of that contemplation. By its exist-
ence alone, the lily of the field sings the glory of the heav-
ens, the goddesses and gods—in other words, the elements
that it contemplates in contracting. What organism is not
made of elements and cases of repetition, of contemplated
and contracted water, nitrogen, carbon, chlorides and sul-
phates, thereby intertwining all the habits of which it is
composed?[27]

Not only does a tree draw on other unique machines, but it is
itself composed of other tiny machines—a cell is a little machine,
itself drawing on all sorts of flows from other cells—and produc-
ing other machines such as fruit, odors, oxygen, etc. A focus on
entities as machines rather than objects draws our attention to
how entities function, what they do, how they couple with other
entities, and what they produce in these operations, rather than
what qualities or properties entities might have.

However, it would be a mistake to conclude that the relation-
ship between machines and the matters that flow through them is
a relation between the active (machine) and the passive (matter),
or unformed matter and formative machine. As Stacy Alaimo
suggests with her concept of trans-corporeality, machines are as
much modified by the matters that flow through them as they
modify the matters that pass through them.[28] The tree will grow
differently depending on that chemical composition of the water
that it draws on, the nutrients available, the temperatures in
which it grows, the nature of the air about it; even the altitude at
which it grows and the wind it encounters will modify the nature
of the tree. For example, near my house I have a tree that tilts in a
particular direction. I suspect that this tree grew in that way be-
cause the area of Texas I live in is often quite blustery. The
growth of the tree was a sort of compromise, a synthesis, of the
tendency of the tree to grow upwards and the commonly present
force of fierce wind. This tree, as it were, is petrified wind; wind
that has been inscribed in the flesh of wood.

Here we have a beautiful example of gravity as conceived by
onto-cartography. The trans-corporeality of machines entails that
machines are *plastic* or *malleable*. Their qualities are not fixed,
but rather can change as a result of their encounters with other

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[27] Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (Columbia:
Columbia University Press, 1994), 75.
[28] Stacy Alaimo, *Bodily Natures: Science, Environment, and the Material
Self* (Bloomington: Indiana University Press, 2010).

machines in a regime of attraction or spatio-temporal gravitational field. It is this that necessitates the distinction between virtual proper being and local manifestation. If it is true that a machine can undergo qualitative variations while remaining that machine, it becomes clear that a machine can no longer be defined by its qualities. Rather, qualities must not be conceived as *properties* of a thing, as something a thing *has*, but rather as *activities* or events on the part of a thing. Qualities are *doings*. The color of a ball, for example, varies depending on the lighting conditions in which the ball currently exists. It is now bright red, now rust colored, now deep red, and now black or colorless depending on changes in the type of light the ball interacts with. If we had an ontologically accurate language, we would not say that the ball *is* red, because the ball is many colors depending on changing circumstances, but rather would say that the ball *reds* under particular lighting conditions. If we cannot individuate a machine by its qualities, then it follows that the being of machines must be individuated by something else. I argue that this something else consists of powers, capacities, and the operations of which the machine is capable. Here it should be noted that the powers and operations of a machine can fluctuate and change as a result of the trans-corporeal encounters it undergoes. For example, my power of cognition is temporally diminished—and perhaps permanently so—as a result of encounters with alcohol. These powers and operations are the virtual proper being of a machine. The important thing here is that the domain of a machine's powers is always broader than whatever qualities it happens to embody at a particular time and place. As Spinoza said, "we do not know what a body can do."[29]

Every body, every machine, is always capable of more than it happens to actualize at any given time. By contrast, the local manifestation of a machine refers to its actualized properties or qualities at a particular point in time and space. Local manifestations are manifestations because they are actualizations of a particular property or act. For example, the red of the ball. They are local, because they are actualizations of this property under particular local conditions. Given other local conditions, very different qualities and acts would manifest themselves. The ball would actualize the color of rust rather than bright red. Thus, for example, two grains of wheat with identical genomes might display very different properties when grown at different altitudes. The

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[29] Benedict de Spinoza, *Ethics*, in *Spinoza: Complete Works*, trans. Michael L. Morgan (Indianapolis: Hackett Publishing Company, 2002), 280–281.

distinction between virtual proper being and local manifestation allows us to mark the excess of potentiality harbored within any being over any of its actualized features. As such, I here follow Deleuze's prescription to not trace the transcendental from the empirical.[30] The virtual proper being of a machine never resembles its actualized qualities. It is the power to produce these qualities, but that power always harbors within itself the power to produce other, different qualities.

The locality of local manifestation is what I refer to as a "regime of attraction." Regimes of attraction are the relations a machine shares to other machines playing a role in the manifestations or actualizations that take place in the machine. A regime of attraction attracts in the sense that the flows that pass through the machine from other machines "draw out", as it were, various manifestations or actualization in the machine. They are the contextual or environmental perturbations that lead the machine to actualize particular qualities. In short, regimes of attraction are the spatio-temporal gravitational fields that play a key role in both the becoming and movement of entities. We already saw an example of the role played by these fields in becoming with respect to our tree as petrified wind. There the tree grew as it did, it became as it did, as a result of how it integrated wind with the development of its cells. It was this integration in time and space that led the tree to actualize this particular bent shape.

Yet these gravitational fields or regimes of attraction also play a key role in the movement of entities. From the standpoint of onto-cartography, space and time are not the same everywhere, and movement is not materially possible in all directions. In short, onto-cartography proposes a network conception of space and time. The way in which roads are laid out in a city play a role in what is related to what, how one entity has to move in order to reach another place, as well as the time it takes to get from one place to another. In Euclidean space, two locations might be quite proximal to one another, but because of the presence of fences and how the walls are laid out, it can become quite difficult to reach a particular location. The walls and roads exercise a certain gravity on movement that affects social relations. While, in Euclidean space, I am metrically much closer to the president of my college than to Eileen Joy, who resides in Ohio, she is spatially and temporally much closer to me than the president in onto-cartographical space and time because I can contact her more directly, whereas with the president I must pass through all sorts

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[30] Deleuze, *Difference and Repetition*, 135.

of levels of administration to interact with him. The bureaucracy of the college functions as a spatio-temporal gravitational field, distending time in a variety of ways, impacting my ability to influence the president of my college. Additionally, entities are only selectively open to influences from their environment. Rocks are not responsive to speech. Bones cannot be healed through talk therapy. In *The Trial* and *The Castle*, Joseph K. discovers that bureaucracies speak entirely different languages that we cannot understand and that do not understand our language. I cannot be perturbed by light in the ultra-violet spectrum of light, yet mantis shrimp can.

It is these complicated dynamics of becoming and movement characteristic of regimes of attraction that onto-cartography seeks to theorize. Where *The Democracy of Objects* sought to theorize the structure of machines and their dynamics, onto-cartography strives to theorize relations between machines and how they create spatio-temporal vectors and paths of becoming and movement. This project is not merely one of intellectual interest—I hope—but also generates a practice that I refer to as "terrarism," denoting a practice in and of the earth.[31] The practice of terrarism has three dimensions: cartography, deconstruction, and terraformation. Cartography consists in the mapping of fields of material and semiotic machines so as to discern the spatio-temporal gravitational fields they produce or the paths and vectors of movement and becoming they generate. Deconstruction refers to the severing of relations that inhibit the becoming and movement of entities we're partial to within a regime of attraction. Sometimes deconstruction will consist in classic modes of semiotic critique and analysis such as we find in cultural studies (deconstruction, psychoanalytic critique, ideology critique, cultural Marxist critique, cultural feminist critique, queer critique, genealogical critique, etc.). At yet other times, deconstruction will consist in literally striving to remove certain entities from a regime of attraction so that they no longer inhibit the becoming and movement of entities. For example, environmental work that strives to reduce greenhouse gas emissions because of their impact on living beings is an example of material deconstruction. Similarly, recognizing that malaria has a profound impact on people culturally and economically, preventing them from pursuing other ends, might lead us to strive for ways to remove malari-

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[31] For a discussion of terrarism, see Levi R. Bryant, "Terraism," *Larval Subjects*, October 4, 2011: http://larvalsubjects.wordpress.com/2011/10/04/terraism.

al microorganisms from particular environments. Finally, ter-raformation consists in the attempt to construct regimes of at-traction or spatio-temporal networks at the level of semiotic and material machines that allow for better becomings and forms of movement. The point that we must always remember, however, is that every machine harbors hidden potentials at the level of its virtual proper being, forever haunting us with the possibility that it will behave in destructive ways when subtracted from existing regimes of attraction or when placed in new spatio-temporal fields. Terrarism must always be practiced with caution and hu-mility, premised on an understanding that we do not fully know what any machine can do and that no machine can be fully mas-tered.

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