

Assembling the Mechanosphere: Monod, Althusser, Deleuze and Guattari

‘Phyla, layers, branches, etc...’
—Teilhard de Chardin, *The Phenomenon of Man*

Abstract:

While the ‘mechanosphere’ is a concept mentioned only six times in *A Thousand Plateaus*, it is fundamental to the way Deleuze and Guattari construct their geophilosophy. In this article, I argue that the mechanosphere solves what Louis Althusser calls the idealist coupling of mechanism and spiritualism implicit in Teilhard de Chardin’s noosphere and in Jacques Monod’s appropriation of the term. My contention is that the mechanosphere must be contextualised within Althusser’s critique of Monod, delivered during the ‘Philosophy Course for Scientists’ at the École normale supérieure rue d’Ulm in 1967. Reading *A Thousand Plateaus* (1980) against Monod’s *Chance and Necessity* (1970) and Althusser’s *Philosophy and the Spontaneous Philosophy of Scientists* (1967/1990), I argue that the mechanosphere evacuates the spectre of an ‘idealist tendency’ latent in Monod’s molecular science. By refashioning Teilhard’s Omega point, Deleuze and Guattari create a sphere that serves as an asymptote on the horizon of ecological history—a projected point of complete destratification between the production of human subjects and planetary ecology. Ultimately, the mechanosphere nuances contemporary treatments of the Anthropocene, asking us to consider not only how humanity is overwhelming natural forces, but also how the former category is becoming increasingly indistinguishable from the latter.

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I. The Anthropocene’s Central Dogma

Emerging literature on the Anthropocene—the geochronological period in which humanity begins to affect planetary ecology (Crutzen and Stoermer 2000: 17-18)—risks redoubling a formal oversight from the history of science. In his 1958 paper ‘On Protein Synthesis’, Francis Crick described what he called the central dogma of molecular biology: the one-directional flow of genetic information from DNA through RNA to protein. Crick’s thesis was eventually disproven by the discovery of retroviruses such as HIV, which are capable of performing reverse transcription—writing themselves into the building blocks of biological matter. While we have entered an epoch in which the human can radically alter and reshape nonhuman planetary forces, many contemporary treatments of the Anthropocene neglect to reverse the causal chain and ask how the breakdown of the borders between the ‘natural’ and the ‘human’ prompts a revision of the latter category as well as the former. If the anthropic is becoming a major planetary force, then questions such as ‘are humans now overwhelming the great forces of nature?’ seem wrongly focussed, founded upon a soon-to-be obsolete distinction (Steffen, et al. 2007: 614).

This article illuminates Deleuze and Guattari’s notion of the ‘mechanosphere’ to find a way of talking about these blurred borders, what Sam Solnick has called the Anthropocene’s reverse transcription (2012). Building upon the claim that ‘the human is the first geological force to become conscious of its geological role’ (Szerszynski 2012: 171), I suggest that it is impossible to consider the Anthropocene without reconsidering the epistemological and ontological categories that divide the living from the nonliving. In doing so, my explication of the mechanosphere shares moments of convergence with Timothy Morton’s recent treatment of ‘hyperobjects’. Structured like a Klein bottle and emerging within nonlocal events such as climate change, the hyperobject is predicated upon human action while simultaneously absorbing and influencing the human actor (2012: 25-6). The

mechanosphere introduces a much-needed concept into environmental and philosophical discourse by communicating this ‘simultaneous dependency of humans on geophysical processes and the technoscientific entrapment of ecosystems and geochemical cycles over the last two centuries’ (Saldanha 2015: 211). Coming to terms with the Anthropocene requires more than admitting that ‘the Whole is contained by its Part’, that planetary systems now hinge upon the ‘socio-economic mode of production of one of the species on earth’ (Žižek 2010: 333). Rather, the mechanosphere prompts a reconfiguration of the part and an expanded sense of the whole. It asks us to take seriously the earth and the human as two branches of the same abstract machine. The human circulatory system, the circulation of capital, and the global carbon cycle are not independent processes, but mutually constitutive assemblages.

To understand how the mechanosphere bears upon the present moment requires historicising the conditions from which it emerged. Beginning with Pierre Teilhard de Chardin’s theory of the noosphere, I argue that the Deleuze and Guattari solve what Louis Althusser called the idealist coupling of mechanism and spiritualism implicit in Jacques Monod’s appropriation of Teilhard. My contention is that the mechanosphere must be contextualised within Althusser’s critique of Monod, delivered during the ‘Philosophy Course for Scientists’ at the École normale supérieure rue d’Ulm in 1967. Reading *A Thousand Plateaus* (1980) against Monod’s *Chance and Necessity* (1970) and Althusser’s *Philosophy and the Spontaneous Philosophy of Scientists* (1967/1990), I argue that the mechanosphere evacuates the spectre of an ‘idealist tendency’ latent in Monod’s molecular science, banishing the final traces of teleology from teleonomy. By refashioning Teilhard’s Omega point into the mechanosphere, Deleuze and Guattari create a limit case—a projected point of complete destratification between the production of human subjects and planetary ecology.

II. New Spheres: Vernadsky and Teilhard

While the ‘mechanosphere’ is a concept mentioned only six times in *A Thousand Plateaus*, it is fundamental to the way Deleuze and Guattari construct their geophilosophy. Known alternatively as the rhizosphere and the hypersphere, the mechanosphere is both continuous with and divergent from earth science’s other layers: the geosphere, biosphere, and noosphere. If the geosphere is the umbrella term for an amalgam of the lithosphere, hydrosphere, cryosphere, and atmosphere, the biosphere is the zone of collective biological life, which spans across the earth as a layer of intersecting relations. There is an implied emergence in these connected systems. The geosphere begets the biosphere. Teilhard de Chardin’s description of a *noosphere*—the stratum of ideas, language, mind—follows a similar etiology, as only when the geosphere and biosphere cohere can language/knowledge enter world history. The geology of Teilhard is inseparable from an idealist *telos*—ecological history becomes a progression, both forward and upward.

The mechanosphere is a fourth phase, the expected movement of *geo-* through *bio-* and *noo-* to *mechano-*, but also a sphere of totalisation, sometimes synonymous with the plane of consistency, subtending all that came before. ‘There is no biosphere, but everywhere the same Mechanosphere’ (Deleuze and Guattari 2013b: 79). The biosphere may have created the conditions for the emergence of the mechanosphere, that ‘set of all abstract machines and machinic assemblages outside the strata, on the strata, or between strata’ (82). And yet, with the advent of the Anthropocene, those machinic assemblages have the capacity to turn back and modify the strata that hold them in place. While the biosphere gave rise to the mechanosphere, the networks of machines (real and abstract) that now cover the earth intervene in its systems, rendering obsolete any rigid demarcation between these strata. Instead, there are only flows (semiotic, social, material) that constitute interpenetrating bodies. Once we ‘enter the age of the Machine, the immense mechanosphere, the plane of cosmicization of forces to harnessed’, there is no going back—or, to use a form of aphorism popular in discussions of Adorno: after mechanosphere, no biosphere (399).

In looking back towards earlier conceptions of the earth's spheres, I want to underscore how questions of organic and inorganic entwinement were present in these concepts from their genesis. While the term 'biosphere' can be traced back to Eduard Suess's usage in 1875, it gained particular prominence when mineralogist and crystallographer Vladimir Ivanovich Vernadsky published *The Biosphere* (1926). Vernadsky's biosphere exists in a reciprocal relation with the geosphere. While the latter may have created the conditions that gave rise to the former, it also becomes inseparably interwoven with its processes. 'It is evident that if life were to cease the great chemical processes connected with it would disappear, both from the biosphere and probably also from the crust' (Vernadsky 1998: 56). Anticipating James Lovelock's Gaia hypothesis, Vernadsky posits that the biosphere is not simply an accidental evolutionary twist in the history of the earth's geological development, but rather an expected and necessary emergence. 'Without life, the crustal mechanism of the earth would not exist' (58). Here life serves an extension of the non-living. The same holds true moving down from the gaseous layers of earth's atmosphere towards the crust—for 'living matter can be taken as an *appendage of the atmosphere*' (87; original emphasis). Substituting Vernadsky's empiricism for mysticism, Teilhard de Chardin reshapes this reciprocal relationship into the doctrine of the transcendental Omega point.

A doctor of Geology and devout Jesuit, Teilhard began his career as a paleontology specialist before moving into more occult directions in an attempt to reconcile Christian theology with evolutionary biology. Like Vernadsky, he troubles the distinction between the vital and the inert, the biosphere and the geosphere, by placing these states in a continuum bridged by 'transitional forms'. Whereas the research inherited from Darwin and Lamarck suggested a 'gaping void' between protoplasm and mineral matter, the discovery of certain zymotic viruses in Teilhard's time seemed to imply '*intermediate states* between the microscopic living world and the ultra-microscopic "inanimate" one' (de Chardin 2008: 82-3; original emphasis). In Teilhard's system, the advent of life is not a cosmic accident but the directed outcome of the geosphere's natural processes. As such, the earth becomes a vast, interconnected 'network' from which it is impossible 'to isolate a portion without it becoming frayed and unraveled at all its edges' (44). In a crypto-messianic slight-of-hand, Teilhard's teleology not only explains the emergence of life, but also the birth of a thinking being.

Thus all around us, deeper than any pulsation that could be expressed in geological eras, we must suppose there to be a total process which is not of a periodic character defining the *total* evolution of the planet; something more complicated chemically and deeper within matter [...] (101)

This 'something more' lying latent in matter is evolution's desire to become aware of itself. Paralleling Nietzsche's description in *The Genealogy of Morals* of the soul's creation through a 'turning-inward' of consciousness, Teilhardian evolution is directed toward the emergence of reflection, 'the power acquired by a consciousness to turn in upon itself, to take possession of itself *as of an object* endowed with its own particular consistence and value' (165). Reflection becomes an elemental property—the outcome of a secret progress.

In this historical narrative, the various stages of the earth's evolution map onto its multiple spheres: the geosphere (geogenesis) created the biosphere (biogenesis), which ultimately led to 'noogenesis' and the creation of the *noosphere*: a psycho-geological envelope of mind and thought. An invisible thinking layer composed of an interconnected network of human minds, the noosphere is as indispensable to the biosphere as the biosphere to the geosphere. While the biosphere is a hodgepodge of fundamentally different life forms, divided by kingdom, phylum, and class, the noosphere achieves systemic regulatory by uniting this 'network of divergent lines, free at their extremities' (251). Once a state of complete interconnectivity reaches the Omega point—anticipating Deleuze and Guattari's fascination with rhizomatic structures—the noosphere gives way to a kind of super humanity.

The idea is that of the earth not only becoming enclosed in a single thinking envelope so as to form, functionally, no more than a single vast grain of thought on the sidereal scale, the plurality of individual reflections grouping themselves together and reinforcing one another in the act of a single unanimous reflection. (de Chardin 2008: 252)

At the Omega point, the particular and the universal—what Teilhard calls the All and the Person—achieve a unity equivalent to dialectical sublation. Teilhard's human is 'the last-born, the freshest, the most complicated, the most subtle of all successive layers of life', who will end history by pointing the way toward 'the final unification of the world' (224). The Omega point is a form of transubstantiation—the spirit of thought lifted beyond the limitations of the human body and engraved in the fabric of the universe itself. The question Teilhard inadvertently raises—whether or not it is possible to recuperate an ecological reading of the noosphere without recourse to a Christian / spiritualist framework—is at the centre Althusser and Monod's disagreement, which forms the backdrop to Deleuze and Guattari's mechanosphere.

III. No Spheres: Monod and Althusser

In the last decade, Deleuze Studies has seen a rekindled interest in the intersections between Deleuze and Guattari's writings and those of their scientific contemporaries. The deep influence of biological thinkers like Jacques Monod, François Jacob, Lynn Margulis, Ilya Prigogine, and Mary Jane West-Eberhard is still coming to light (Eckstrand 2014; Clark 2012; Marks 2006; Bonta 2004). The two volumes of *Capitalism and Schizophrenia* are particularly indebted to Monod's *Chance and Necessity*, for several concepts in *Anti-Oedipus* and *A Thousand Plateaus* are explicitly built upon Monod's work. Most relevant is a section in the former where Deleuze and Guattari explicitly credit Monod with conceiving of machinic synthesis without inheriting traditional oppositions from the history of science.

Desiring-machines work according to *régimes* of syntheses that have no equivalent in the large aggregates. Jacques Monod has defined the originality of these syntheses, from the standpoint of a molecular biology or of a "microscopic cybernetics" without regard to the traditional opposition between mechanism and vitalism (Deleuze and Guattari 2013a: 328).

The passage alludes to Monod's description of allosteric enzymes, non-living structures that nonetheless seem to exhibit cognition through their ability to sort and order without the imposition of 'an already constituted highly ordered system' (May 2005: 91). It is important to note that Deleuze and Guattari are selectively responding to the intensive potentials in Monod's otherwise reductionist and mechanistic account of molecular biology. Recalling the intermediate state between vital and inert described by Teilhard, allosteric enzymes become prototypes for what the two later describe as the 'prodigious idea of *Nonorganic Life*' (2013b: 479; original emphasis). By combining disparate elements in novel ways, these enzymes exhibit the chance and necessity of Monod's title. It is a necessity that enzymes perform their function, but the way in which they meet, interact, and ultimately produce life is a matter of chance. '[T]he morphogenetic processes that build the macroscopic structure of living beings are both "autonomous" and "spontaneous"' (Monod 1972: 11). This is but one of the many examples Monod uses to show how teleonomy can appear as Teilhardian goal-directed evolution, when, in fact, it is a blind process that lacks any kind of *telos* (Monod 1969: 326).

Allosteric enzymes anticipate the double figure of the wasp and the orchid, taken up in *A Thousand Plateaus* to illustrate the concept of becoming, by enabling synthesis, recombination, and emergence between heterogeneous elements without a predestined outcome. They differ from other enzymes in

that their formal composition and binding affinity shifts based on the presence of modulators / effectors. This is to say that the products of these enzymatic reactions, which synthesise some of the building blocks of DNA, are not determined by the structure of the enzyme itself, but rather by chance chemical and environmental conditions.

Allosteric proteins help to set up a selective interaction between substances which, if left alone, would never exchange energy, or interact in any way. [...] I have used the word 'relay' [*relais*], and it is the right one, inasmuch as the role of allosteric proteins is to link up metabolic circuits that, being chemically independent, can only acquire their teleonomic importance through strict coordination. (Monod 1969: 330-1)

For Deleuze and Guattari, the orchid and the wasp exemplify a similar process through the two-fold movement of de- and reterritorialization. The male Thynnid wasp pollinates orchids from the *Drakaea* genus because the flowers grow a labellum that simulates the female wasp's reproductive organ. This moment of inter-species joining is marked by the 'becoming-wasp' of the orchid and the 'becoming-orchid' of the wasp. Borrowing the language of Monod's allosteric relay, 'the two becomings interlink and form relays in a circulation of intensities [*se relayant suivant une circulation d'intensités*]' (Deleuze and Guattari 2013b: 9).

In *Chance and Necessity*, Monod elucidates how Darwinian evolutionary principles function on the molecular level. As chance mutations create preservative genetic innovation, they give rise to necessity—a result of reproductive invariance rather than some kind of purposive final causality. 'All the functional adaptations in living beings, like all the artifacts they produce, fulfill particular projects which may be seen as so many aspects or fragments of a unique primary project, which is the preservation and multiplication of the species' (Monod 1972: 13). Explicitly channelling Albert Camus's essay on Sisyphus, Monod finds a corollary between absurdist existentialism and the blind processes of biological evolution, casting religion, mythology, and 'the construction of vast philosophical systems' as 'the price this social animal has had to pay to survive without having to yield to pure automatism' (167). Analysing (and dismissing) theories of vitalism, descendants of Bergson's *Élan Vital*, Monod proceeds to critique animist views, typified by the 'intellectual spinelessness' of Teilhard's philosophy (32). Describing his logic as 'hazy' and his style 'laborious', Monod condemns the scientist for 'systematic truckling, a willingness to conciliate at any price, to come to any compromise' (32).

If Monod's assessment seems to slip from the intellectual to the personal, there is a historical explanation: Louis Althusser publically criticized Monod's use of Teilhard's ideas several years earlier. Published in 1970, *Chance and Necessity* built upon the inaugural lecture Monod gave to the Collège de France on 3 November 1967. In the lecture, entitled 'From Molecular Biology to the Ethics of Knowledge', Monod not only includes a discussion of Teilhard's philosophy, he takes up the language of his noosphere to describe cellular communication. A vast 'intercellular communications system, capable of transferring messages about the experiences of one cell to another some distance away from it' becomes a prototype for the eventual interconnected network of minds (Monod 1969: 332). Unsurprisingly, Monod's biosphere moves toward 'central co-ordination', capable of 'storing, combining, transforming and retrieving information' along a network of 'quasi-instantaneous communication lines' (332). While this is an accurate description of the networked nature of molecular systems, his description is steeped in the language of Teilhard's Omega point. He later turns explicitly to the noosphere, describing it as 'the emergence within the biosphere of a new kingdom, the kingdom of ideas and knowledge' (332). It is a sphere defined by interconnection, coming into being on the day when the 'associations and creative ideas of one individual could be transmitted to others' (332).

While Monod paints with broad brushstrokes, he nevertheless offers a Darwinian alternative to

Hegelian dialectics, a history of ideas based on natural selection and survival of the fittest. ‘The success of an idea will depend firstly on its power of invasion which is doubtless linked to its particular structure; to its ability to supersede and assimilate other ideas, and this, at first, irrespective of its selective value for the individual or the group that adopts it’ (333). Here ‘power of invasion’ replaces ideology, and successful ideas gain parasitic overtones. In a move that Althusser heavily criticises, Monod ends his lecture with Heidegger’s statement that language speaks man as much, if not more, than man speaks language.

[L]anguage, once introduced, conferred a greatly increased selective value upon the capacity for storing and combining information. Accordingly, language must have preceded, perhaps by a very long time, the emergence of the nervous system characteristic of man [...] In other words, language created man, and not *vice versa*... *the living are always and increasingly dominated by the dead.* (Monod 1969: 331; original emphasis)

By creating a quasi-structuralist account of language in which the living are subservient to the dead, Monod anticipates Jacques Lacan’s framework of the linguistic unconscious, in which subjectivity is produced by a network of always already present language. In *Chance and Necessity* he reverses this position, citing Noam Chomsky’s arguments for a universal grammar (129). In the lecture, however, the overtones of the Omega point are palpable, for Monod’s linguistic preservation fantasy—the belief that the agency of the dead is somehow transferred to language—reworks Teilhard’s description of ‘the hominsation of death itself’ (2008: 272). He concludes his speech with a grand charge for an ‘aggressive, in some ways even Nietzschean, ethic’ comprised of a ‘will to power, in the noosphere alone’ (Monod 1969: 336).

Devoting an entire appendix to Monod’s lecture during his seminar at the École normale supérieure rue d’Ulm in 1967 (a seminar which Monod attended), Louis Althusser critiqued Monod’s recourse to Teilhard as latently idealist: undermining his distinction between teleology and teleonomy. If readers of *Chance and Necessity* (like Deleuze and Guattari) were not already aware of this critique, Monod devotes an early paragraph to a discussion of what he calls Althusser’s ‘severe commentary upon my inaugural lecture before the Collège de France’ (40). In many ways, Althusser’s critique of Monod is an attempt to begin reconciling structuralist Marxism and dialectical materialism with mid-century developments in genetics and heredity. By imposing biological mechanisms onto social relations, Monod ‘perceives only the *intention* of his discourse and not its *objective* effect’ (Althusser 1990: 153). The objective effect here is the mystification of State ideological intervention. Ascribing a ‘survival of the fittest’ schema onto the noosphere implies that class relations, the history of ideas, politics, and the apparatuses of capital are justified through reification—that capitalism has ‘won out’ over other ideologies due to selection (in the genetic sense) and superiority. This question—how to account for the materiality of apparatuses, capital, and labour in relation to ecosystemic processes (geo / bio / noo) without recourse to a latent idealism—forms the bedrock of Deleuze and Guattari’s development of the mechanosphere.

The ‘Philosophy Course for Scientists’ seminar began in the fall of 1967 and ended with the eruption of May 1968. While most of the lecture notes were heavily revised before publication, the appendix ‘On Jacques Monod’ was reproduced as delivered (Althusser 1990: 145). To understand the critique of Monod’s noology, one must first take account of the ‘spontaneous philosophy of the sciences’ (SPS). Discussing the relationship between ideology and science, Althusser distinguishes between ELEMENT 1—the internal, ‘intra-scientific’ beliefs that spontaneously arise from scientific practice itself—and ELEMENT 2: the external, ‘extra-scientific’ beliefs that are imposed upon this practice in an attempt to co-opt the empirical method along ‘religious, spiritualist, or idealist-critical “philosophies of science”’ (133). Because ‘the balance of power within an SPS cannot be changed through immanent critique’, the two elements exist in a dialectical relationship, with the extra-

scientific ELEMENT 2 serving as a negation or ‘counterforce’ (139). Tracing an account of the relationship between idealism and materialism in the sciences, Althusser argues that twentieth-century scientific practice (ELEMENT 1) is essentially materialist, but is dominated by an idealist ideological framework (ELEMENT 2). His proposed solution takes the form of an ‘*alliance of scientists with materialist philosophy*, which brings to scientists the extra forces needed so to reinforce the materialist element as to dispel the religious-idealist illusions that dominate their SPS’ (137; original emphasis). Philosophical critique (of the Marxist-materialist strain) traces a ‘line of demarcation’ between science and the ideology, freeing scientific practice from interdisciplinary exploitation (99).

The greatest idealist offender is none other than Teilhard de Chardin and his supporters. Accusing the ‘paleontologist and priest’ of ‘exploiting science for the profit of his faith’, Althusser can find nothing in his work ‘to counterbalance the vacuous and deluded enterprise of a paleontologist dressed in a cassock’ (121). He worries that by taking up Teilhard, Monod risks muddling the distinction between ‘strictly scientific content and the philosophical use of which it is object’ (145). As Althusser reiterates throughout the lecture, Monod’s scientific practice displays a profoundly materialist tendency. However, the scientist’s world-view relies upon an idealist account of language and linguistic evolution. The trouble comes in Monod’s account of the noosphere, which feigns a materialist origin story but actually necessitates an idealist account of humanity’s emergence.

In making this extrapolation, Monod believes himself a materialist because for him language is not a spiritual origin, but simply an accidental emergence which has the informational resources of the *human central nervous system* as its biophysiological support. Yet, in his theory of the noosphere Monod is *in fact* (though not according to his stated convictions) idealist — to be precise, mechanistic-spiritualistic. (Althusser 1990: 150)

This ‘idealist use of the materialist content of a determinate science’ imposes the terms of microbiology through an imaginary, ideological relation upon the terms of another science (the study of human societies). What Monod does is to ‘assume that there is a universal logic or content (in this case biological) that describes each and every process no matter how materially or functionally disparate’ (Lewis 2005: 192). By couching his world-view in a form of Hegelianism that Althusser spent a career trying to dismantle (‘fill[ing] the void of the “noosphere” with the help of the Spirit’), Monod inadvertently furthers an ideology that he believes he is eradicating (Althusser 1990: 152).

IV. *n* Spheres: Deleuze and Guattari

While the terms ‘noology’ and ‘mechanosphere’ appear across *A Thousand Plateaus*, the most revealing insight into their relation and divergence is found in ‘1227: Treatise on Nomadology—The War Machine’. Following Kant’s use of the term in the *Critique of Pure Reason*, Deleuze and Guattari give noology an external status, similar to Althusser’s ELEMENT 2. It is separate from ideology in its ability to critique images of thought without becoming absorbed back into these images, thus avoiding Marcuse’s institutional desublimation or Gramsci’s hegemony. ‘Noology, which is distinct from ideology, is precisely the study of images of thought, and their historicity’ (Deleuze and Guattari 2013b: 438). By taking images of thought seriously, noology provides an externality to the repressive apparatus of the State. And yet, this form of study always seeks to replace one image of thought with another. In contrast to the public philosopher, who ‘privileges fixed forms and stable movements’, the Nomad, or private thinker, produces ‘counterthoughts’ (Read 2009: 99). Nomadic thinking does away with the very need for noology.

[T]he form of exteriority of thought [...] is not at all *another image* in opposition to the image inspired by the State apparatus. It is, rather, a force that destroys both the image *and* its copies, the model *and* its reproductions, every possibility of

subordinating thought to a model of the True, the Just, or the Right (Cartesian truth, Kantian just, Hegelian right, etc.). [T]he form of exteriority situates thought in a smooth space that it must occupy without counting, and for which there is no possible method, no conceivable reproduction, but only relays [*relais*], intermezzos, resurgences. (Deleuze and Guattari 2013b: 439; original emphasis)

If, for Althusser, the noosphere smuggles idealism into materialism, nomadic exteriority provides an elegant solution. Rather than resurrecting some form of the True, the Just, or the Right, Deleuze and Guattari describe a sphere of thought composed of difference, interruption, connection, and continuous movement. Here again we find Monod's language of the 'relay'—a molecular metaphor applied macroscopically. Instead of maps or systems, 'there are only lines' of interconnection and heterogeneous recombination (7). As such, this image of thought is impossible to reduce and totalise within an image—we are in the realm of bricoleur rather than the engineer, to borrow a distinction from Lévi-Strauss.

The similarities between Deleuze and Guattari's State apparatus and Althusser's Ideological State Apparatuses (ISAs) are worth noting (Surin 2006: 57-76). They share a primary task and goal, what Althusser ascribes to the reproduction of the conditions of production (1971: 127). For Deleuze and Guattari, 'the State is perpetually producing and reproducing ideal circles' (2013b: 428). While the State in *A Thousand Plateaus* exerts power through capture and seizure, Althusser's ISAs work across social strata (family/law/education/politics/culture) to interpellate individual actors, ensuring the continued reproduction of material ideology (Deleuze and Guattari 2013b: 410; Althusser 1971: 143). In both systems, it is possible to cordon off an external zone of critique, not fully subject to the State or Ideology. For Deleuze and Guattari, this zone is the radical exteriority of the nomadic war machine; for Althusser (following Lenin), it is philosophy's unique ability to draw a dividing line between true and false ideas. In both cases, the proposed exteriority is not actually exterior, but exists as a borderline point of hindrance and resistance within a dominant apparatus that always seeks to absorb and assimilate. 'Most significant are perhaps borderline phenomena in which nomad science exerts pressure on State science, and, conversely, State science appropriates and transforms the elements of nomad science' (Deleuze and Guattari 2013b: 422). Similarly, Althusser writes that 'ideology *has no outside* (for itself), but at the same time *that it is nothing but outside* (for science and reality)' (1971: 175). The two schemas radically diverge, however, in their treatment of interpellation and subjectification.

Deleuze and Guattari's most sustained engagement with Althusser takes place in a discussion of how content and expression cannot be reduced to a base-superstructure relationship (2013b: 78). Althusser begins his essay 'Ideology and Ideological State Apparatuses' with the same claim (1971: 136). And yet, while Althusser avoids vulgar economic determinism by redefining the ideology as a material set of relations and practices, Deleuze and Guattari reject ideology as 'the most execrable concept obscuring all of the effectively operating social machines' (2013b: 79). Form and content (the base and the superstructure) 'involve two parallel formalizations in presupposition: it is obvious that their segments constantly intertwine, embed themselves in one another; but this is accomplished by the abstract machine from which the two forms derive, and by machinic assemblages that regulate their relations' (79). The proliferation of machinic assemblages maintains Althusser's most significant contribution to Marxist theory—that 'ideology always exists in an apparatus, and its practice, or practices'—while doing away with the division between a base and superstructure (1971: 165). Interpellation occurs along material lines as the end product of a complex machine. It is not 'a question of a movement characteristic of ideology, as Althusser says'; rather, 'subjectification [...] is tied to an assemblage, in other words, an organization of power that is already fully functioning in the economy' (Deleuze and Guattari 2013b: 151). This distinction liberates the subject from the 'always-already' fatalism of Althusserian ideology and Monod's noology—we may always already be subjects, but that subjectivity is not 'a condition internal to language' (151). Rather, it is the product of a

network of assemblages—which may include (but is not limited to) a regime of signs or a form of expression. Thus, it becomes possible to think of new ways of assembling subjects with nonhuman components. Just as Teilhard's noosphere is coeval with a thinking being, Deleuze and Guattari's mechanosphere signals a new type of agent, whose body extends beyond the borders of the human form.

The mechanosphere absorbs the geosphere, biosphere, and noosphere into a virtual entity. Deleuze and Guattari recognise the pitfalls of Teilhardian thinking, writing that 'it is difficult to elucidate the system of the strata without seeming to introduce a kind of cosmic or even spiritual evolution from one to the other, as if they were arranged in stages and ascended degrees of perfection' (79). This cosmic or spiritual evolution from one sphere to the other is the idealist recuperation that Althusser finds in Monod. Instead of falling prey, the mechanosphere absorbs differentiation between strata. 'There is no biosphere, but everywhere the same Mechanosphere' (79). Deleuze and Guattari present Althusser's materialist alternative without falling back upon ideological causality, drawing instead upon the figure of the rhizome. The strata of the earth become interconnected to the point of complete multiplicity: 'you can't even tell in advance which stratum is going to communicate with which other, or in what direction' (80). Composed of non-hierarchical flows of divergent elements, the mechanosphere exorcises idealism's spectral haunting of the biosphere. 'Above all, there is no lesser, no higher or lower, organization; the substratum is an integral part of the stratum' (80). As if directly responding to Monod's privileging of the noosphere, Deleuze and Guattari allow the geologic to comingle with the cognitive: 'a semiotic fragment rubs shoulders with a chemical interaction, an electron crashes into language' (80). The mechanosphere opens the earth to the possibility of recombinatory destratification: the radical (and potentially dangerous) re-assemblage of matter into novel collectives.

The mechanosphere is to nomadic externality what the noosphere is to an idealist image of thought. In many ways, it is a materialist refashioning of Teilhard's Omega point, stripped of the latter's religious and anthropocentric overtones. While Teilhard envisions a 'plurality of individual reflections grouping themselves together' into an act of 'single unanimous reflection', nomadic thinking wants to preserve difference (de Chardin 2008: 252). Both the mechanosphere and the noosphere expand the limitations of the human, but while the Omega point designates a transcendent function that lifts humanity above the limits of the mind and body, the mechanosphere blurs the borderline of the body (geological, biological, anthropological) through a function of immanence. 'At *n* dimensions [the rhizosphere] is called the Hypersphere, the Mechanosphere. It is the abstract Figure, or rather, since it has no form itself, the abstract Machine of which each concrete assemblage is a multiplicity, a becoming, a segment, a vibration' (2013b: 294). This is not to say that the difference between human and nonhuman dissolves; rather, *becoming* facilitates an expansion of bodily capabilities through the networked exchange of assemblages and abstract machines. As these exchanges proliferate, the mechanosphere comes into view.

If the importance of the mechanosphere seems compromised through the scarcity of its invocation, it is important to remember the last sentence of *A Thousand Plateaus*: 'Mechanosphere' (597). As with many last words, it is both an elegy for what has passed and an anticipation of states to come. It is now apparent that climate change is approaching a point of irreversibility. In 2015, the earth's mean temperature rose 1° C above preindustrial records, halfway to the critical two-degree mark. In the same year, the United Nations Intergovernmental Panel on Climate Change (IPCC) published its Fifth Assessment Report (AR5) demonstrating that even if greenhouse gas levels were to suddenly drop to those of decades past, climate change could continue for centuries. All the while, the hand of capital is readily conspicuous in its complicity with these crises. The 2015 Volkswagen emission scandal revealed the depths of corporate connivance and international environmental fraud, and it has recently been confirmed how ExxonMobil conducted in-house research as early as 1977 that unequivocally demonstrated the devastating effects of fossil fuel combustion. Meanwhile, the

composition of human and animal bodies are quietly changing in relation to these global events, with industrial chemicals like Perfluorooctanoic Acid (PFOA) flowing through the earth's most remote bloodstreams.

When thinking about the Anthropocene, the mechanosphere offers a critical tool for plotting the intersection of planetary systems, organic bodies, and industry. Its potential immanence forms an asymptote in the horizon of ecological history. We may never reach the point of complete destratification implied by the *mechano-*, but the irreversible possibility of melding the planetary and the human looms large. The full force of this set of problems remains underexplored—further work is necessary to trace how the aleatory relays of certain spheres maintain their autonomy in the wake of the deterritorializing effects of capital. While Marxist phenomenological traditions have long recognized capital's ability to shape our perception of the 'world', the process by which it captures the *earth* is becoming more visible than ever before. In spite of the inseparable entanglement of the techno-industrial complex, the composition of biological life, and the earth's tectonic activity, popular climate rhetoric often clings to an Edenic narrative: we have fallen from our earthly garden, but perhaps it is possible to clamber back through a combination of economic penance and consumer asceticism. In calling for a 'reverse transcription' of the Anthropocene, Deleuze and Guattari's mechanosphere offers a critical intervention at a timely moment.

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