Earth Becomes World?

Scientific Objects, Nonmodern Worlds, and the Metaphysics of the Anthropocene

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Abstract In coming to grips with the advent of the Anthropocene, contemporary philosophers have recently pushed beyond its many physical implications (e.g., global warming, reduced biodiversity) and social significance (e.g., climate justice, economics, migration) to interpret the Anthropocene metaphysically. According to such interpretations, the Anthropocene imposes nothing less than a wholly new understanding of the world. This raises the question regarding the character of such an imposition. To develop this question, this article discusses three metaphysical interpretations of the Anthropocene: Clive Hamilton's, Timothy Morton's, and Bruno Latour's. Among many voices today, these authors are specifically relevant because they predominantly correlate the imposition of a new, nonmodern world with the scientific object "Earth" as it is developed in Earth system science. The purpose here is to elucidate the ways in which this correlation is made, and to inquire after the role of science—a modern activity par excellence—in the advent of the world of the Anthropocene. The critical question is how this role could be legitimated in the proclaimed absence of a modern framework ensuring science's status as a beacon of certainty and truth.

Keywords Anthropocene, Earth system science, modernity, metaphysics

Introduction: Anthropocene and Demodernization

According to Earth system science (ESS), the planetary impact of human activity warrants a narrative of the geological epoch named the Anthropocene, where humanity becomes the dominant Earth-shaping force.[1] The Anthropocene marks "the first instance of a new epoch having been *witnessed* firsthand by advanced human societies [and] one stemming from the consequences of their own doing."[2] A paradoxical stage is

1. Crutzen, "Geology of Mankind."
2. Waters et al., "Anthropocene Is Functionally and Stratigraphically Distinct," 145 (our emphasis).

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set: humans appear both as *dissociated* witnesses of a planetary epochal alteration, and simultaneously as those preeminently *associated* as actively responsible for its occurrence. This remarkable fusing of the witness of the world and responsible subject in the world[3] has prompted philosophers to look beyond the many physical implications (e.g., global warming, reduced biodiversity) and social significance (e.g., climate justice, economics, migration), to interpret the Anthropocene metaphysically. The stakes are nothing less than the imposition of a wholly new understanding of the world.

This raises the question as to how such an imposition must be understood. To elucidate this question, this article discusses how Clive Hamilton, Timothy Morton, and Bruno Latour interpret the Anthropocene as a metaphysical event. Among the many voices today, these authors are specifically relevant for two reasons: First, they consider the Anthropocene to render the disintegration of modernity both possible and imperative: either the Earth-shaping and Earth-raping human beings nail up the coffin and commit the metaphysical framework of modernity to Earth, or modernity becomes their sarcophagus. Second, these authors predominantly correlate this metaphysical interpretation of the Anthropocene with a newly discovered protagonist: the scientific object called Earth.

This protagonist is remarkable inasmuch as it figures both as offspring and sterilizer of modernity. This can be clarified epistemologically, technologically, and ontologically. Epistemologically, the findings of modern techno-science (satellite data, intricate computer models, etc.) wielded by ESS bring Earth into view as a scientific object,[4] which is to say as an integrated dynamic Earth system that is on the verge of becoming uninhabitable for its dominant—that is, human—geo-force. It is this viewpoint that first makes the concept of the Anthropocene intelligible and is begotten by a modern framework, which renders Earth a discrete object standing against the vantage point of a somehow dissociated subjective position and scientific gaze. As such, both Earth qua Earth system and the Anthropocene appear as modernity's offspring.

Further, the globally warmed and potentially uninhabitable Earth spawns from modern techno-industrialism and concomitant "great acceleration."[5] This too is begotten by the way in which modernity rendered Earth a res extensa, which has become an extended resource to be mobilized and greatly accelerated by techno-industrial intervention.[6] In witnessing how such intervention brings ruin to habitats, some respond by doubling down on the modern constitution by steadily translating scientific (e.g., ecological and ESS) findings into a call for more advanced technological action, ranging from

3. Coeckelbergh, "Scientific Suspects, Romantic Witnesses?"

4. de Boer, *How Scientific Instruments Speak*.

5. Steffen et al. "Trajectory of the Anthropocene"; Angus, *Facing the Anthropocene*.

6. Hamilton, *Defiant Earth*, 65; Hamilton, *Requiem for a Species*.

sustainable development to climate engineering.[7] Such actions should then allow for eventually celebrating a "good, or even great, Anthropocene."[8]

By contrast, turning to ontology rather than technology, Hamilton, Morton, and Latour do not merely see the Anthropocene as the *outcome* of modernity but as the possibility and imperative to *come out* of its metaphysical snare. For them, pipe dreams of turning the poison into a cure by modern means such as smarter, bio-based (geo)technology, overlook how the newly discovered Earth is no longer a dissociated object, thing, or resource to be kept at a distance from where it can be mastered and possessed by human subjects. In their own words, "There is no Earth capable of containing [the modern] ideal of progress, emancipation, and development,"[9] as it contradicts "the understanding of the world brought by modernity,"[10] such that this "is not a problem that modernity can solve."[11] The Anthropocene accordingly concerns a metaphysical mutation, where modern dissociation between objects and subjects runs up against a "defiant Earth" that brings lofty human subjects "down to Earth" in such a way that they cannot "achieve escape velocity from Earth."[12]

It appears, then, that although initially accessed by way of modern scientific epistemology and reacting to modern technological interventions by becoming increasingly inhospitable, Earth in the Anthropocene ontologically recoils upon its dissociated modern spectators to draw them into a new world of associations. Modernity's offspring turns against its parent and conjures the necessity of a demodernized understanding of the world. Quoting the authors under investigation once more:

> A new object has appeared, the Earth System, [and its appearance] has ontological meaning.[13]
>
> Hyperobjects [like Earth] bring about the end of modernity.[14]
>
> The present situation, in which the physical framework that the Moderns had taken for granted, the ground on which their history had always been played out, has become unstable.[15]

If these are the stakes, the central question becomes what endows this earthly protagonist with such ontological prowess. How must the relation between the scientific object called Earth qua Earth system and this new, nonmodern understanding of the world be thought? Is there something unique about this scientific object that rather

7. Zwier and Blok, "Seeing through the Fumes," 622–27; Baskin, "Paradigm Dressed as Epoch."

8. Asafu-Adjaye et al., "Ecomodernist Manifesto"; cf. Fleming, *Fixing the Sky*. A critical discussion is elaborated on in Hamilton, *Earthmasters*.

9. Latour, *Down to Earth*, 16.

10. Hamilton, *Defiant Earth*, 36.

11. Morton, *Hyperobjects*, 19.

12. Hamilton, *Defiant Earth*; Latour, *Down to Earth*; Morton, *Hyperobjects*, 160.

13. Hamilton, *Defiant Earth*, 20–21.

14. Morton, *Hyperobjects*, 94.

15. Latour, *Facing Gaia*, 3.

than adding scientific knowledge to the world, it issues its overturning? And can this object be compared to other techno-scientific discoveries such as electrification, informatization, or the discovery of microbes that have also challenged habits and habitats?[16]

The purpose of this article is to elucidate the ways in which Hamilton, Morton, and Latour navigate these questions. This should serve to shed light on the role of science—a modern activity par excellence—in the advent of the world of the Anthropocene. Given the prominent role that ESS plays in the discourse of the Anthropocene in general and in the work of Hamilton, Morton, and Latour in particular, the guiding critical question will be whether and how the nonmodern child can do without its modern parents: how can the role of science be legitimated, especially in the proclaimed absence of a modern framework ensuring its status as beacon of dissociated certainty and truth?

Clive Hamilton's Terrestrial Modernity

Hamilton's answer is that Earth as disclosed by ESS uniquely engenders a new world. By way of ESS, Earth appears as "a whole in a constant state of movement driven by interconnected cycles and forces, from the planet's core to the atmosphere and out to the moon, and powered by the flow of energy from the sun. It is a single, dynamic, integrated system, and *not* a collection of ecosystems."[17] Understanding Earth as Earth system involves a paradigm shift with respect to older ecological and meteorological science.[18] Whereas these studied landscape, local climate, Earth's crust, or global environment as isolated phenomena from a dissociated scientific perspective, ESS shifts paradigms inasmuch as it studies Earth as an associated, integrated, total system.[19] Atmospheric physicist Hans Schellnhuber compares this shift to the Copernican revolution: "Sophisticated information-compression techniques including simulation modeling are now ushering in a second 'Copernican' revolution. . . . This new revolution will be in a way a reversal of the first: it will enable us to look back on our planet to perceive one single, complex, dissipative, dynamic entity . . . the Earth system."[20] Yet even more radically than shifting scientific paradigms, Hamilton regards the "leap towards Earth System Thinking"[21] as philosophical and ontological: "If Earth System science is a paradigm shift in the Earth sciences, then it is prompting an ontological shift in self-understanding and the human-Earth relation."[22]

This shift entails that observers are now associated as an "integral and interacting part of the Earth System itself."[23] By implication, the Anthropocene and discovery of the

16. Cf. Latour, *Pasteurization of France*.

17. Hamilton, *Defiant Earth*, 12.

18. Hamilton, *Defiant Earth*, 10, 13.

19. Hamilton, *Defiant Earth*, 12, 19.

20. Schnellnhuber, "Earth System Analysis."

21. Hamilton, *Defiant Earth*, viii.

22. Hamilton, *Defiant Earth*, 64.

23. Steffen, Crutzen, and McNeill, "Anthropocene," 615; see also Hamilton, "Anthropocene as Rupture," 94. For an ontological analysis of this perspective, see Zwier and Blok, "Saving Earth."

Earth system puts the hitherto dissociated witness on trial. If the antecedent situation corresponded to a camera obscura where a subject observes an object through a scientific lens,[24] the subjective and objective positions within ESS are perhaps best illustrated as images between two mirrors, where, to slightly modify Jan Zalasiewicz's famous dictum: the face of the one determines the face of the other.[25] This complicates where the face of the human ends and the face of Earth begins, thus uprooting and renewing the question regarding "the place of humans on Earth."[26]

However, one might object that such association is not at all unique to ESS. Research in the field of science and technology studies (STS) has recurrently stressed the situational, contextual, and thus *associated* character of science to deconstruct its masquerading as impartial, *dissociated* witness. Such studies suggest that scientific dissociation and objectivity is a (collective) practical achievement at best, or at worst an imperious stratagem that pursues a politically biased agenda under the banner of an unbiased factual testimony.[27]

In response, Hamilton argues that the association revealed by ESS is unique: it is universal in a sense that the grand narrative of enlightenment never quite achieved, as it finally marks the invention of a truly universal, "unified entity, the *anthropos* [as] *the central agent*."[28] Universality here no longer roots in universal dictates of transcendent reason but is buttressed by "a kind of universal reason—the logic of Earth System Science."[29] Put in terms of the abovementioned mirror-staging: every weather event now has a human fingerprint, meaning that all Earthly dynamics touch and are touched by an anthropos that is woven into the fabric of Earth. In recognizing that the Anthropocene thereby also brutally and unjustly touches humans or collectives that have hardly lifted a finger to manipulate global climate, Hamilton resolutely objects to conflating social analysis with ESS: "From an Earth System viewpoint, there are on Earth no divisions between North and South or between nations, cultures, genders, and races. There are only humans with more or less power to disturb it."[30] Hence, although there may be good

24. See Aydin and de Boer, "Brain Imaging Technologies."

25. Jan Zalasiewicz and cowriters describe a situation in which "natural and human forces [are] intertwined, so that the fate of the one determines the fate of the other." Zalasiewicz et al., "New World of the Anthropocene," 2231.

26. Hamilton, *Defiant Earth*, 59.

27. Donna Haraway already spoke of "situated knowledges" in the 1980s. Haraway, "Situated Knowledges." Such studies further importantly include anthropological and Indigenous scholarship, which critically studies modernity, modern science, and Western metaphysics from a different, non-Western perspective. For discussion related to the concept of world, see de la Cadena and Blaser, *World of Many Worlds*; Danowski and de Castro, *Ends of the World*. For a related epistemological orientation, cf. de Sousa Santos, *Epistemologies of the South*. Further analysis of these perspectives is beyond the scope of the question developed here, which is mainly focused on authors who seek to articulate the limits and bankruptcy of modernity by way of a modern, scientific development. The question regarding the outcomes of a confrontation between the abovementioned scholarship and the authors discussed here is left open.

28. Hamilton, *Defiant Earth*, 49.

29. Hamilton, *Defiant Earth*, 79.

30. Hamilton, *Defiant Earth*, 34, 92.

reasons for differentiating humanity and human agency in politico-ethical contexts, Hamilton refuses to deconstruct the anthropos by, for example, unmasking it as a Western ideological and imperialist projection, laying bare its clandestine political economy,[31] or redistributing its misconceived centralized agency.[32] Such a deconstructive maneuver tends to deflate agency at a time when human agency is large enough to disrupt the functioning of the Earth system, thus denying "the monumental scale of the rupture in the Earth's and human history known as the Anthropocene."[33]

In sum, Hamilton follows the scientific insight that Earth "has moved well outside the range of the natural variability exhibited over the last half million years [and] is currently operating in a no-analog state,"[34] as well as the insight that this roots in the system's specific human parameter. Earth thereby does not merely denote a scientific object for a new scientific paradigm but engenders "an ontological shift."[35] This raises the question as to what this shift implies.

The implication is that the Anthropocene undermines the modern framework according to which humanity and the world are understood. Similar to how the advent of modernity ruptured the hitherto stable understanding of the world by way of its mechanization and the throning of the rational subject, so the Anthropocene ruptures "the understanding of the world brought by modernity."[36] Hamilton finds the essence of modernity in the Kantian dissociation of the *mundus intelligibilis* consisting of subjectivity, rationality, and freedom, from the *mundus sensibilis* of nature, lawful regularity, and necessity.[37] This bifurcation occasions a humanity with "turbocharged agency . . . combining freedom from oppression with power over nature, using science and technology and the institutions that mobilized them."[38] In the Anthropocene, ESS ruptures this bifurcation by laying bare how "the wanton use of our freedom and technological power have led us to the brink of ruin."[39]

ESS, then, does not merely bring an integrated system into view but discloses how a turbocharged geo-power within that system undermines conditions of life and disrupts the functioning of the system as a whole.[40] For Hamilton, such disruption is made

31. As in J. Moore's *Capitalism in the Web of Life*; and J. Moore, "On the Nature and Origins."

32. A point developed in Tsing, "Unruly Mushrooms"; Tsing *Mushroom at the End of the World*; Bennett, *Vibrant Matter*.

33. Hamilton, *Defiant Earth*, 59. In passing, it can be noted that this argument is bound to leave science-deconstructors and agency-distributors unconvinced, since it is premised on what they precisely deny: that anthropic agency is unified and that natural science is categorically different from social analysis. Yet instead of settling this dispute, it can here be instructively read as a clear indication of Hamilton's commitment to a unified Anthropos.

34. B. Moore, Lemke, and Loreau, "Amsterdam Declaration."

35. Hamilton, *Defiant Earth*, 128.

36. Hamilton, *Defiant Earth*, 36.

37. Hamilton, *Defiant Earth,* 82, 100. See, for example, Kant, *Groundwork for the Metaphysics of Morals*, 57.

38. Hamilton, *Defiant Earth*, 110.

39. Hamilton, *Defiant Earth*, 37.

40. Hamilton, *Defiant Earth*, 17, 36–37.

possible by the modern framework that celebrates human freedom to make use of Earth. Marx could still view Earth as "the great workshop, the arsenal which furnishes both means and material of labor [and which] offers no resistance to [attempts to] relate to it as the inorganic nature of the living individual."[41] This modernly portrays a compliant and passive Earth to be valorized through labor and technological intervention. By contrast, the Anthropocene confronts moderns with the circumstance that the Earth they sought to possess and master is not compliant but *defiant* and is "pulling back."[42]

Such "pulling back" indicates how rather than an overpowered and exploited victim on its last legs, Earth has awoken from its Holocenic slumber and can easily shrug humanity off its surface when stretching its limbs, incidentally placing "Atlas shrugged" in a new light.[43] Further, the realm of freedom that took itself to be dissociated from an Earth offering, as Marx said, "no resistance" to its projects, is pulled back down to Earth and exposed as always having been surreptitiously Earth-associated.[44] Further still, modernity is pulled back to its fountainhead of Cartesian *omnibus dubitandum*: "In the face of the Anthropocene rent in the fabric of the world, we are obliged to doubt all of our beliefs."[45] No longer finding an unshakable ground in the *fundamentum inconcussum* of a dissociated res cogitans,[46] but feeling the tremors underneath its feet, a "new anthropocentrism" must "learn to live on a capricious Earth."[47]

This exposition may serve to demonstrate how Hamilton correlates Earth and world: incommensurable to other scientific objects and discoveries, Hamilton's Earth uniquely imposes a new world. Its rediscovery by ESS delivers the "epoch-marking fact" that contradicts the "modern world picture."[48]

Be that as it may, it is striking that notwithstanding the many declarations of its destitution and ruin, Hamilton's interpretation ultimately *affirms* modernity as, to use Jürgen Habermas's classic formulation, an "unfinished project."[49] Despite its fortress being attacked and ruptured by Earth on several fronts at once, a remarkable legion of explicitly modern detachments come out of the onslaught relatively unscathed. Pulled back down to Earth, the anthropos of the Anthropocene stands strong as a unified, powerful, and willful agent, the discoverer and dissociated *witness* of scientific, even epoch-marking facts. In the end, "one cannot reject modernity's actual distancing, but only challenge the form it took. . . . It is not our split from nature that must be overcome, but our violence against it."[50] One may then critically question whether Hamilton has either

41. Marx, *Grundrisse*, 472.
42. Hamilton, *Defiant Earth*, 46.
43. See, for example, McGuire, *Waking the Giant*.
44. A point developed in Zwier and Blok, "Seeing through the Fumes."
45. Hamilton, *Defiant Earth*, 38.
46. As per Descartes's formulation in the *Meditations on First Philosophy*.
47. Hamilton, *Defiant Earth*, 36, 158.
48. Hamilton, *Defiant Earth*, 36–49.
49. d'Entrèves and Benhabib, *Habermas and the Unfinished Project*.
50. Hamilton, *Defiant Earth*, 143.

overstated the ontological meaning of the Anthropocene by a considerable margin or shies away from the implications of his own diagnosis. Faced with the demand "that we set aside our accustomed understanding and reconsider everything,"[51] he ends up reconsidering but a limited number of things: the Anthropocene predominantly affects one fraction of the modern bifurcation—namely, human freedom that has now become "tightly bound by a wild and defiant realm of necessity"[52] and must accordingly be newly attuned to Earth and its limits.

Regarding the status of the scientific object called Earth, it becomes clear that although initially portrayed as uniquely imposing a new world, we find a rather conventional scientific object that adds understanding to a modern world. A dissociated scientific witness augments decisively factual knowledge of Earth's astoundingly intricate dynamics. This knowledge then feeds into the old Delphic *gnōthi seauton*, or knowledge of self, where it "narcissistically offends" this self in a manner that appears far from unique when one recalls Freud's original offenses: Copernicus, Darwin, and Freud.[53]

The fact that ESS conceptualizes humanity as an associated and unified geo-force and parameter does not seamlessly carry over into ontology—even more so when the ontology thus heralded supposedly fractures the modern bedrock undergirding science. Either one witnesses scientific "epoch-marking facts"[54] from a dissociated position that hovers above and therefore contradicts the epochal change instantiated by Earth according to ESS, or one becomes associated with a new world that incorporates the scientific witness in the indictment. In contrast to Hamilton, Timothy Morton radically probes the latter alternative.

Timothy Morton: Earth Ending World

Morton's work similarly responds to what he calls a "fundamental shaking in being," which is "correlated with the Anthropocene" and ends the modern world.[55] How does this shaking and ending correlate with Earth witnessed as scientific object?

To answer this question, it is fruitful to contrast Morton's position with the above-mentioned idea that Earth is a conventional scientific object that adds knowledge to the world. Morton rejects this idea, albeit in a distinctive way. He agrees that ESS discloses Earth as a real object, but understands this object to be unconventional since it cripples the modern way in which objects are understood. He calls Earth a "hyperobject,"[56] where *hyper* denotes an excess, meaning that every attempt to fully come to grips with the object flounders, as it slips, quoting Emerson, "through our fingers when we clutch

51. Hamilton, *Defiant Earth*, 36.

52. Hamilton, *Defiant Earth*, 140.

53. For narcissistic offense, see Freud, *Eine Schwierigkeit der Psychoanalyse*. Hub Zwart associates this concept with techno-scientific developments such as ESS in his *Psychoanalysis of Technoscience*.

54. Hamilton, *Defiant Earth*, 47.

55. Morton, *Hyperobjects*, 7, 19.

56. Morton, *Hyperobjects*, 31.

hardest."[57] Whereas modern science is usually regarded as such a "hard clutch" due to its orientation toward certainty, prediction, and control, Morton maintains that although hyperobjects like Earth[58] are discovered by way of "the instrumental and mathematical formulas of modernity itself," they slip through its grasp and exceed the modern framework that attempts to accommodate them.[59] Yet, rather than a techno-scientific deficit to be overcome by way of an augmented instrumentarium or improved methods, the withdrawal "from total access" denotes a property or "uncanny essence" of objects themselves.[60]

In interpreting this withdrawal, Morton explicates and transposes an aspect that is familiar to modern science as well as modern philosophy, both of which have hitherto shielded themselves from its full implications. As to the first, science is all too familiar with incomplete access, not only because of an instinctive suspicion to all proclaimed final scientific truths (a regulative ideal at best and the cause of a halt to scientific progress at worst) but also because modern particle physics knows that measuring position implies withdrawal of momentum and vice versa.[61] Scientific thought thus generally recognizes the withdrawal of things and is quite aware that, paraphrasing Niels Bohr, instead of having a dissociated full view of the stage from the balcony, the scientific spectator takes to the stage as an associated actor.[62] Still, its fine-tuned methods allow for such a high degree of prediction and control that the actor prevails as the protagonist who tames the unruly excessiveness and withdrawal of things and thus remains on top of them.

A similar maneuver can be found in modern philosophy, where Hume's skepticism transfigured causal and therefore factual knowledge of nature from a fully accessible and apodictic "relation of ideas" to the great but always situated and therefore necessarily limited guide of custom or habit.[63] Morton follows suit: "Natural means habitual," which implies that one's habits and habitat play an active role in what constitutes objective knowledge, such that instead of a dissociated witness with an external view on reality or nature, "you are included in [its] interpretation."[64] On the one hand, Kant already observed this inclusivity: "Thus the order and regularity in the appearances, which we entitle 'nature,' we ourselves introduce. We could never find them in appearances, had we not ourselves, or the nature of our mind, originally set them there."[65]

On the other hand, the introduction of order and regularity could for Kant not be a matter of all too feeble habit or custom but was guided by a universally calibrated

57. Morton, *Hyperobjects*, 201.
58. Other hyperobjects include global warming, evolution, or the biosphere. Morton, *Hyperobjects*, 27–31.
59. Morton, *Hyperobjects*, 19, 46–55.
60. Morton, *Being Ecological*, xxix; Morton, "Here Comes Everything," 165.
61. Morton, *Hyperobjects*, 41–44.
62. See Bohr, "Discussion with Einstein."
63. Hume, *Enquiry concerning Human Understanding*, 19, 32.
64. Morton, *Being Ecological*, xxxii, xxxv.
65. Kant, *Prolegomena*, 122.

synthetizing and schematizing human subject. Despite saving the appearances from the vicissitude of habit, this left the withdrawal of objects from full access in place, since certain knowledge now only concerned *phenomena*, or things-for-me, from which the *noumena*, or things-in-themselves, withdraw. For Morton, this accentuates what is characteristic of modernity—namely, the yawning gap between the *data*, understood as what is phenomenally given to be "ordered and regulated," and the therefrom withdrawing noumenal *thing* or *object* itself.[66] Much like the aforementioned scientific spectator becoming an actor that nonetheless remained cast as protagonist, Kant tames the implications of this data-thing gap by keeping a transcendental subject on top of things as their prime regulator and realizer. In transposing this thought and extending it "beyond the human-world gap,"[67] Morton agrees that "you can't grasp things in themselves, facts are different from data, and data is different from things" but holds that this does not entail that "what gets to decide what's real . . . is more real than those things, whether the decider is the Kantian subject, Hegelian history, Marxist relations of human production, Nietzschean will to power, or Heidegger's flickering lamplight of Dasein."[68] Hence, instead of being concentrated in a transcendental, dissociated subject, realization is distributed among all entities in an incessant associative play of interobjectivity. Noumenal objects emanate phenomenal data, which other objects interpret and realize in multifaceted ways: a human being realizes a spoon as a tool for eating soup, a fly realizes it as landing strip, honey realizes it as something to stick to, light as something to reflect off, and so on.

On the one hand, scientific objects are no different. The Earth system is realized by theories, thinking subjects, geological formations, computer models, carbon emissions, oil refineries, and so on, while concurrently itself realizing objects such as Earth system scientists and extinction rebellions. On the other hand, certain scientific hyperobjects are unique inasmuch as in their excessiveness and refusal to submit to modern ordering and regulation they unmask the modern isolated and dissociated "master-realizer" as an anthropocentric illusion.

Similar to Hamilton's considerations, this can be explained by the *pull* of hyperobjects like Earth or global warming: "Am I being pulled? . . . I do not make decisions outside the universe and then plunge in, like an Olympic diver. I am already in."[69] Hyperobjects like global warming pull its observers inside itself. Although originally discovered through modern dissociation, the crucial experience is that they are inescapably associative and loom over everyday weather conversations, from starting a car to sending a "thank you email."[70] For Morton, this explicates that the very idea of dissociation, or

66. Morton, *Being Ecological*, xxix.
67. Morton, *Hyperobjects*, 18.
68. Morton, *Being Ecological*, 14.
69. Morton, *Being Ecological*, 115.
70. Morton, *Hyperobjects*, 99; Moss, "Pointless Emails."

"the idea that I'm outside the world, looking in," is no longer tenable.[71] Inasmuch as it discovers hyperobjects, "science itself becomes the emergency break that brings the adventure of modernity to a shuddering halt," implying that "there's no going back."[72]

This exposition demonstrates how Morton's Earth uniquely imposes a new world. This must be further qualified, however, since although it concerns a scientific object, Earth's uniqueness has little to do with conventional scientific objectivity and factuality. For Morton, "science is nothing more than a collection of . . . data,"[73] facts are a specific way of interpreting data, and the idea of a self-contained, dissociated objective fact is a relic that was "designed to look like it dropped out of the sky" by a modern framework.[74] In discovering the hyperobject Earth, this framework primed its own demise: "We have arrived at the next moment of history, not by dint of our efforts, but because the very inner logic of science ran up against a limit, revealing the uncanny . . . [hyper]objects for all to see."[75] Hence, instead of conceding to a traditional interpretation in terms of objectivity or factuality, Earth refuses accommodation in a modern whole by a dissociated witness or master-realizer. This refusal rudely awakens this realizer from its anthropocentric dogmatic slumber.

Rather than leading to new scientific knowledge, facts, or certainties, this revelation has aesthetic significance. Morton follows Kant's conception of aesthetic experience as "nothing else than the state of the mind involved in the free play of imagination and understanding,"[76] where the latter two terms refer to Kant's executive realizers of data. The experience of beauty, for instance, involves a "feeling of ungraspability," which fails to fully and smoothly impose "order and regularity in the appearances," a failure that itself offers a glimpse of the usually overlooked "free play" involved in realizing data.[77] Transposing this once more from subjectivity to interobjectivity, Morton deanthropocentrizes Kant's idea that this "free play" exclusively takes place in the subject so that "the experience is coming from you, not the artwork": this play is the doing of objects themselves.[78] The hyperobject Earth uniquely discloses this interobjective play because its aesthetic experience is primarily one of catastrophe, which Morton reads literally as the "downward-turning" of transcendental subjectivity. Rather than being dissociated from Earth to admire its beauty or to cower before its factually established ecological disasters,[79] the catastrophe is markedly associative: "Catastrophes involve you."[80] As such, the scientific object called Earth qua artwork catastrophically induces

71. Morton, *Being Ecological*, 118.
72. Morton, *Hyperobjects*, 21; Morton, *Being Ecological*, 79.
73. Morton, *Being Ecological*, 177.
74. Morton, *Being Ecological*, xviii.
75. Morton, *Hyperobjects*, 158.
76. Kant, *Critique of Judgement*, 49.
77. Morton, *Being Ecological*, 3; Kant, *Critique of Pure Reason*, 125.
78. Morton, *Being Ecological*, 80.
79. For Morton's position on factuality, see Morton, *Being Ecological*, xvi–xvii.
80. Morton, *Hyperobjects*, 20.

an aesthetic experience of being-involved in an interobjective, post-Kantian "free play" of data realization: "It is sort of like having data, but the data isn't pointing at anything but itself—I'm just experiencing the givenness of data, of what is given."[81]

Morton's Earth thus uniquely imposes a new world, or, more accurately, Earth ends the modern world and sabotages the concept of world as such.[82] As hyperobject and artwork, Earth offers itself to aesthetic experience as a Wagnerian Gesamtkunstwerk, or "collective artwork"—with "work" denoting the ongoing interobjective realizing of data. Such continuous realizing implies the end of the very notion of world, as world always expresses a now forfeited stable and dissociated anchor point.

Although this answers the question pertaining to Morton's correlation of Earth and world, it also raises the question as to how to comport oneself vis-à-vis its explication. Since it can no longer be a matter of lofty dissociated objectivity or subjectivity, Morton argues that "ontology . . . is a vital and contested political terrain."[83] The critical political function of Morton's recalibration of the modernist data-thing gap is to highlight how the modernist dissociation situates the nonhuman hierarchically lower.[84] Resonant with Hamilton's critique, the concurrent mastery, use, and exploitation of everything nonhuman results in mass extinction, the defining characteristic of the age of the Anthropocene and global warming.[85] Yet where Hamilton seeks to recalibrate the modern subject by way of a new, more enlightened anthropocentrism, Morton aims to unmask modern ontology as such. When this mask is cleared away and the swarm of intermingling and emanating objects confronts aesthetic experience, he does not seek to "contain [the] wavering" and tame the nonhuman swarm.[86] Rather, he attends to how "the not-me beckons, making me hesitate" and accordingly pursues a mode of coexistence and solidarity that not merely tolerates but appreciates (non)human interobjectivity, a mode he refers to as "being ecological."[87]

The task of critical politics: clearing modern obstacles that obstruct being ecological, thereby pursuing association and letting heretofore excluded nonhumans in. It can be noted, however, that the other side of critique that Kant targeted when he "solemnly and legally suspended . . . all [pre-critical] metaphysicians" from their occupations[88]—which is to say critique as delimitation, dissociation, and exclusion—remains unclear in Morton's thought. Although aware that nonhumans like "sharks . . . and viruses can

81. Morton, *Being Ecological*, 74.

82. Morton, *Hyperobjects*, 94.

83. Morton, *Hyperobjects*, 20.

84. Morton sees modernity as the latest offshoot of a deeply rooted way of hierarchical thinking that, echoing Nietzsche, he traces to the advent of agriculture, or "agrilogistics," as he calls it in *Dark Ecology*. A detailed study of this genealogy is beyond the scope of the present study.

85. Morton, *Being Ecological*, 1.

86. Morton, *Being Ecological*, 118.

87. Morton, *Being Ecological*, 119–25.

88. Kant, *Prolegomena*, 20.

kill you and it would be a good idea to protect our human selves from viruses and sharks,"[89] Morton is not truly interested in "the deadly concept of survival,"[90] since "ecological catastrophe has been wrought in [its] name . . . sheer existing without heed to any *quality* of existing."[91] Be that as it may, it nonetheless remains questionable whether such a quality can be thought solely inclusively, without any form of dissociation or exclusion. It is here that Latour's work becomes relevant, since contrary to Morton, he maintains that the Anthropocene demands a novel yet nonmodern distinction between inside and outside.

Bruno Latour: Facing Gaia and the Battle for the Terrestrial

In *Facing Gaia*, Latour stages a humanity that is ill prepared to face a disruptive terrestrial object to which it is simultaneously most intimately related: Earth, or *Gaia*. Living under its shadow, and with its cataclysmic potential becoming increasingly clear, encountering Earth implies entering a "New Climate Regime."[92] This regime heralds "an alteration of the relation to the world: . . . the scholarly term for madness."[93] Latour holds that it is imperative to face Gaia head-on if rather than sinking into madness, a cure that mitigates the present situation is to be found. This requires asking: What is this Gaia coming towards us in the New Climate Regime? How can we see it coming? And how can we commence facing it?

When confronting the unknown and its potential risks, modern humans generally resort to science and its alleged capacity for certainty and control. Accordingly, when facing the Anthropocene, ESS is often presented as both the messenger sounding the alarm and the administrator offering relevant solutions. From this perspective, the above questions can be answered easily: "What is Gaia? Science will tell us." "How did we see it coming? ESS." "How do we face it? Geoengineering." This logic suggests that the pathway toward scientific certainty helps eliminate madness by offering technological solutions, without further prescribing how human beings should change their lives.

Latour maintains, however, that such a pathway renders us incapable of facing Gaia, because it remains stuck in a modern ontology unfit to cope with the New Climate Regime. This ontology situates science as a dissociated guide to certain knowledge of nature, sharply distinguished from the domains of culture and politics dealing with the unstable and messy preferences and interests of human beings.[94] Latour sees the present failure of such thinking evidenced in the "immense undermining work undertaken by the climate skeptics against the sciences of the Earth System."[95] This work undermines

89. Morton, *Being Ecological*, 60.
90. Morton, *Humankind*, 43.
91. Morton, *Being Ecological*, 63.
92. Latour, *Facing Gaia*, 3.
93. Latour, *Facing Gaia*, 10.
94. Latour, *Facing Gaia*, 4.
95. Latour, *Facing Gaia*, 24.

the self-proclaimed dissociated and disinterested factuality of ESS, instead portraying scientists as politically inclined fanatics peddling a prescriptive agenda to overthrow a particular way of life.[96] Yet by thus unmasking the neutrality and disinterestedness of ESS and climate science, these skeptics present *themselves* as providing the proper cold and disinterested outlook. For Latour, this controversy, in which both parties make a claim to the facts over against the other's political value-statements, constitutes an empirical contradiction of the modern idea that science can be staged as a dissociated witness, thus exemplifying how modern ontology is incapable of facing Gaia.

Latour holds that these controversies are not grounded in the irrationality of certain actors but instead indicate the necessity, as well as harbor the potential, to rethink the role of science in the New Climatic Regime. If such rethinking succeeds, "philosophically, the billions spent by the climate-skeptic lobbies to create the false controversy over the climate will not have been spent in vain."[97] Yet this rethinking no longer takes science as describing a dissociated reality but instead recruits it to increase sensitivity to Gaia. Latour's Gaia is neither neutral nor independent but associates with human actions and descriptions while simultaneously being an intrusive force that humanity should become sensitive to.[98] Put extremely, the sensitivity of Gaia to human activity is of such a nature that without facing it and becoming sensitive to its sensitivity, humanity and Gaia end up advancing their mutual "existential negation."[99]

Given the stakes of the mutual existential negation of humanity and Gaia or Earth in the Anthropocene, scientists should be interested not in dissociated modernist "nature" but in the associated *world* with its many different inhabitants and interests. Latour's notion of world does not so much denote a container that humanity occupies but is "that which opens to the multiplicity of *existents*, on the one hand, and to the *multiplicity* of ways they have of existing, on the other."[100] Being concerned with the "world," then, is not so much to be concerned with a particular entity or stable background but rather with an operation that opens up the following questions that Morton left unanswered: "What existents have been *chosen* [to exist], and what forms of existence have been *preferred*?"[101] Such questions indicate that living in the Anthropocene calls not only for Morton's maximal inclusivity but also for being clear on which existents are, or must be, excluded. Regardless of how these questions are answered—and the New Climate Regime demands ceaselessly answering them—it becomes clear that they are *metaphysical* questions that science alone cannot answer. Connecting this to the question regarding the scientific status of Earth, ESS always does more than just augment knowledge of the world; it is associated in the constitution of the world by redefining its furniture. How can this association be understood?

96. Latour, *Down to Earth*, 17–21.
97. Latour, *Facing Gaia*, 33.
98. On "the Intrusion of Gaia," see Stengers, *In Catastrophic Times*.
99. Latour, *Facing Gaia*, 238.
100. Latour, *Facing Gaia*, 35.
101. Latour, *Facing Gaia*, 37.

To suspend the modern ontology of dissociated "nature" and to become associatively concerned with the world, science must supplement "Galileo's earth, which *moves*, [with James] Lovelock's earth, which *is moved*."[102] From Galileo, modernity inherited the idea that Earth is a planet that like any other hovers in infinite space and is subject to mechanical laws. Since infinite space and mechanical laws are similar everywhere, this gave rise to the idea of the existence of a disembodied and interchangeable mind capable of giving truthful and certain descriptions of all res extensa. However, Latour maintains that Western metaphysics went awry in the hands of Locke, Descartes, and their successors, when this convenient way of doing science was turned into a general philosophy.[103] This resulted in a *bifurcation of nature* in which nature was dissociated into primary qualities (extension, movement, etc.) that could be described without being affected, and secondary qualities (e.g., color, odor, texture) belonging to the domain of the affected subject and therefore escaping the domain of scientific certainty.[104] In this general philosophy, things like "concern" appear as nuisances undermining the quest for certainty, such that the idea of a terrestrial object being *moved* by something other than mechanics appears as an irrational hindrance.

Like Morton, Latour holds that Earth (or Gaia) reveals the breakdown of the modern bifurcation, since "the 'primary qualities' are from now on characterized by sensitivity, activity, reactivity, and uncertainty, while the 'secondary qualities' are characterized by indifference, insensitivity, and torpor."[105] Gaia is being touched by human actions and descriptions, whereas their inability to leave the sinking ship of modernity renders humans indifferent to what is hidden in plain sight: the fact that it pulls Gaia's strings and Gaia pulls back. Be that as it may, this conceptualization of the breakdown of modernity leaves open the question whether Earth qua Gaia *is* the techno-scientifically disclosed Earth, and accordingly, whether and how Earth can be considered to uniquely impose a world.

Latour would be among the first to acknowledge that every novel scientific object can reshuffle the inhabited world.[106] For example, his work on Louis Pasteur's "discovery" of microbes shows how rather than added to a pregiven world, this techno-scientific object actively shapes the world.[107] *Facing Gaia* draws a parallel between the figure of Gaia and Pasteur's microbes by pointing to how the introduction of microbes was met with suspicion because it reeked of unscientific vitalism, just as attempts to show Earth's capability of being moved or pulled (as in Lovelock) are met with suspicion for unjustifiably

102. Latour, *Facing Gaia*, 79.

103. Latour, *Facing Gaia*, 85. Latour here echoes Husserl's diagnosis in *The Crisis of European Sciences*.

104. The concept of bifurcation is developed by Whitehead in *The Concept of Nature*.

105. Latour, *Facing Gaia*, 109.

106. Indeed, in Latour's *We Have Never Been Modern*, "each entity is an event" (81), such that a scientific object also can be understood as "an original event and creates what it translates as well as the entities between which it plays the mediating role" (79).

107. See Latour, *Pasteurization of France*.

blowing life into an inanimate object.[108] What intensifies the parallel between Gaia and Pasteur's microbes is that when Pasteur showed that microbes could neither be reduced to something else nor generated spontaneously, a "*revision* of the list of objects that populate the world, something that philosophers normally and rightly call a *metaphysics*" became necessary.[109] The parallel between Earth and microbes teaches two things:

1. Science does more than just increase understanding *of* the world or nature, and indeed shapes the types of associations *in* the world by introducing new objects.
2. Inasmuch as the coming into being of microbes due to the activity of the Pasteurians implies a form of metaphysics, so does the coming into being of Earth as a scientific object.

This demonstrates how for Latour, science is one of the associative factors constituting a world, a constitution that always involves the question whether a particular world is *desirable* or compels dismantling. Latour's answer to this question regarding the world in the Anthropocene is clear: if we do not dismantle the modern worldview, humanity and Gaia end up in mutual self-negation.

Still, if the Pasteurians also were metaphysicians when adding microbes to the world, to what extent can the Earth that reveals itself as Gaia be said to uniquely impose a new world? Or would it be better to concede that *insofar as* techno-scientific objects are added to reality, each of those imposes a new world?

For Latour, being sensitive to how nonhuman objects, humans, and Gaia are connected in multiple and mutually entangled loops does not—pace Morton—stop at a welcoming aesthetic appreciation of their interobjective play of realization but instead prompts a political incentive: to designate those that neglect, deny, or obscure such loops as enemies.[110] Just as Latour sees the constitution of modernity as a political project from the start, so humanity's ability to face Gaia and establish a novel metaphysics must be grounded in a political act. On Latour's account, modernity's call for a new order of indisputable certainty reacted to the religious wars in the sixteenth and seventeenth centuries. This is best exemplified in Hobbes's Leviathan, which extracted civil society from the state of nature by subsuming it under the sovereignty of the nation-state.[111] By analogy, nature is a sovereign transcending particular nation-states, a domain in which inanimate objects interact like billiard balls according to certain universally binding rational laws that all nation-states necessarily ratify, regardless of their interests. This allowed for designating a neutral dissociated third party capable of solving (religious) disputes as a legitimate arbiter speaking a principally undeniable truth.

108. Latour, *Facing Gaia*, 88.
109. Latour, *Facing Gaia*, 90.
110. Latour, *Facing Gaia*, 141.
111. Latour, *Facing Gaia*, 149.

Latour interprets the modern invention of a universal natural domain and arbiter as a *counterreligious* move that halts the religious wars in the West. Yet *counter* implies that it remains parasitic on religion: "From the true God fulminating against all idols, we have moved to the true Nature fulminating against all the false gods."[112] Just as the truth derived from an ordering deity, so the order of Nature involves truth as "external, universal, and as indisputable as it is indestructible,"[113] with the crucial difference that scientific activity instead of biblical exegesis unveils its secrets.

However, Latour holds that the modern armistice that put religious wars to rest has run its course and must now itself be assailed to open the possibility of thinking politics anew, since the Anthropocene breaches the provisional armistice of modernity.[114] This is why Latour, borrowing from the German jurist Carl Schmitt, maintains that facing Gaia requires distinguishing between friend and enemy, between those who are inside and those who are outside the Anthropocene: "If Gaia could speak, it would say . . . 'Do not suppose that I have come to bring peace to the earth. I did not come to bring peace, but a sword' (Matt. 10: 34)."[115] If the New Climate Regime is to be one of peace, it is necessary to recognize with Schmitt that "one could never speak of peace if one did not first decide to see in the present situation as a state of war—and thus agrees to have enemies."[116]

Latour's idea that science can never function as a neutral, dissociated witness culminates in the realization that science should become Earthbound:[117] concerned with operating in and on a particular world in which Gaia and humanity can coexist instead of entering into mutual existential negation. In doing so, scientists become an important ally for the "terrestrials" of the Anthropocene who need to designate and defend their territory against those who still believe themselves to be living in the Holocene and wish to defend another world. Scientists need to understand themselves as an important party within a terrestrial coalition inhabited by the Earthbound "who know they are in the Anthropocene and who seek to cohabit [a world] with other terrestrials under the authority of a power that as yet lacks any political institution."[118] In being part of this coalition, as well as of the necessary conflict with nonterrestrials that founds it, science should be reconceptualized as a new form of "*non-national power that is explicitly participating as such in geopolitical conflicts*."[119]

In Latour's work, then, Gaia uniquely imposes a new world because it constitutes a new state of war, one with different stakes than those to which modernity offered a

112. Latour, *Facing Gaia*, 157.
113. Latour, *Facing Gaia*, 169.
114. Latour, *Facing Gaia*, 246–47.
115. Latour, *Facing Gaia*, 144.
116. Latour, *Facing Gaia*, 234.
117. Latour, *Down to Earth*.
118. Latour, *Down to Earth*, 90.
119. Latour, *Facing Gaia*, 252.

provisional armistice, and which calls for a new way of distinguishing friend from enemy, inside from outside. ESS and the Earth system as object serve to *announce* this necessity by revealing that Gaia is inescapably shaped by whatever world is constituted and in turn announces what kind of world is no scenario for existential negation. Put differently, the role of science in the New Climate Regime is one of helping define the territory in which the people of the Anthropocene live and with whom they want to inhabit it. A truly nonmodern science is therefore one that appears as one of the weapons at the disposal of the people of the Anthropocene.

Latour seems to be quite optimistic about science aiding unified terrestrials facing Gaia and defending themselves against the people of the Holocene. Yet, without the framework of modernity to sharpen its sword, both the effectiveness of this weapon and its role as banner under which terrestrials can unite remain open questions. In this sense, it can be questioned—based on Latour's own presuppositions—to what extent Latour's quasi-modern proposal[120] to develop a more inclusive representational government in which the concerns of nonhumans are voiced helps the Earthbound to face Gaia while being protected against the Holocene at the same time.

Conclusion

This article aimed to clarify the status of ESS and the associated Earth qua Earth system in relation to how Hamilton, Morton, and Latour metaphysically interpret the Anthropocene as the call for demodernizing the world, disavowing modern dissociation, and navigating an inescapable ontology of association. The question guiding the presented analysis was how these authors navigate the Earth qua Earth system, a distinct modern offspring that seems to turn against its modernist parent, and whether and how such a revolt can be legitimated.

It became clear that although initially committed to the idea that Earth qua Earth system uniquely engenders a new, nonmodern world, Hamilton ultimately countervails this commitment by holding on to dissociated modern science. He critically opposes Donna Haraway's program of "disempowering the conclusions of scientists"[121] and the posthumanities' "cavalier attitude to Earth System Science."[122] He thereby grounds the overcoming of modernity *in* a modern framework that legitimates scientific facts, thus interpreting the "epoch-marking facts"[123] of ESS to contradict the announcement of a new world beyond the modern epoch. If the claim is that "a new object has appeared, the Earth System, [and its appearance] has ontological meaning,"[124] this meaning remains beholden to its modern progenitor.

120. See, for example, Latour, *Facing Gaia*, 274.
121. See Haraway, "Anthropocene, Capitaloscene, Plantationoscene, Chthulucene," 160.
122. Hamilton, *Defiant Earth*, 92–97.
123. Hamilton, *Defiant Earth*, 49.
124. Hamilton, *Defiant Earth*, 20–21.

Morton and Latour are more strongly committed to the idea that Earth in the Anthropocene engenders a new world. Morton explicitly attributes a unique world-ending character to Earth, which necessitates rethinking science beyond its modern articulation. He accordingly sees science itself undermining the modern image of science by revealing the *association* between humanity and hyperobjects like Earth. Rather than offering a legitimization of scientific certainty, Morton's nonmodern "science is actually shifty and uncertain" and "restrains itself from ontological arrogance."[125] Hence, instead of positing certain facts, science arranges data emanated by objects and occasionally, as in the case of ESS, offers an aesthetic glimpse of "the givenness of data" as such.[126] As a form of aesthetics, this is no longer the distant glimpse of a dissociated modern witness, but the proximate glimpse of intimate and always incomplete interobjective involvement. Earth thereby uniquely imposes a new world, or rather demonstrates that "the end of the world has already occurred,"[127] but this is less of a scientific demonstration than an aesthetic exhibition. The advent of hyperobjects, like Earth—an aesthetic rather than scientific object—has terminated modern dissociation, thereby opening the door toward being ecological, an intimate, nonhierarchical, solidary coexistence that appreciates all entities. Within this coexistence, science offers a glimpse on an interconnected real in which human entities happen to participate, with no room for stepping outside. This intimacy announces the impossibility of exclusion and sovereignty, as this would presuppose the existence of a dissociated, exceptional, beyond from which sovereign decisions can be made. In manifesting the clear absence of this beyond, ESS figures as the troubadour that is receptive to what hyperobjects emanate, wielding the appropriate instruments to communicate the call for solidarity with what has been emanated, without voicing any specific prescriptions.

Latour likewise regards the emergence of Earth in the Anthropocene as uniquely engendering a new world, albeit with a significant difference compared to Morton. On the one hand, Morton celebrates science as something that helps offer an aesthetic glimpse of being much more intimate with objects than hitherto recognized, thereby stressing a *welcoming receptivity* to science in the name of being ecological. Latour, on the other hand, advances a conceptualization of science as something to be *actively appropriated* into a political project that necessitates not a warm welcome but a state of war in which a new form of sovereignty must be found.

Gaia breaks down the key pillars of modernity, thereby reformulating the question concerning the epistemological legitimacy of science into a political dispute from which every form of sovereignty has been suspended. Whereas other techno-scientific objects such as microbes imposed something novel that could still exist under the wings of the armistice of modernity, the intrusion of Gaia transgresses all boundaries

125. Morton, *Being Ecological*, xxix, 53.
126. Morton, *Being Ecological*, 74.
127. Morton, *Hyperobjects*, 7.

and participates in every political conflict. In consequence, the armistice of modernity falters as Gaia's sword beheads both the sovereign nation-state and the therefrom-derived conception of sovereign science as a neutral arbiter that settles political disputes.

By integrating science into a new political project, Latour, like Morton, attributes to science the capacity to reveal the interobjective relations constitutive of the world. On the other hand, it should be the project of the Anthropocene to appropriate such relations in order to set limits on what constitutes an inhabitable world. The question of science in the Anthropocene, then, is how it can help circumscribe a territory that is worth defending and find a form of sovereignty in which, instead of mutual existential negation, humans can have Gaia and Gaia can have humans. Facing Gaia requires scientists to "have understood that it is with Gaia, rather than with Nature, that they will have to share every form of sovereignty from now on."[128]

Be that is it may, if one takes seriously that the Anthropocene imposes a new world that beheads the sovereignty of modern science, it becomes impossible to ignore the question "What role can science still play in the Anthropocene?" It is this pertinent question that Hamilton eventually circumvents when upholding the modern position that science is a sovereign fact-making enterprise. Latour and Morton instead attempt to carve out a novel role for science in the Anthropocene. Contrasting their respective positions serves to elucidate this role. For Morton, ESS has revealed the absence of any sovereignty *under* which one can live, implying that living always means to live *in* something, now emphatically in the hyperobject "Earth." However, given the impenetrability of this hyperobject, Morton seems to suggest that it makes more sense to be intimate and solidary with its effects. The legitimacy of science in the Anthropocene, accordingly, is its capacity to function as a work of art allowing us to glimpse *to whom* solidarity should be extended. For Latour, conversely, scientists must be considered to participate in a war in which they will have a benefit when making clearly visible the effects of their findings by making them explicit as prescriptions. Given scientists' successful track record in adding new entities to the world and being able to represent them, a process that Latour refers to as "drawing things together,"[129] he finds it reasonable to expect science to be a faithful and useful ally in the political conflict that the "terrestrials" must engage in. However, if science can no longer be assumed to be a priori authoritative, one can critically question on what ground a decision about whether science "draws things together" in an appropriate or desirable manner can be made.

For both Morton and Latour, in contrast to Hamilton, it appears that the world-engendering character of Earth as a scientific object marks the end of one epoch but withholds the emergence of another, potentially more desirable one. The absence of stability characteristic of the Anthropocene obstructs the constitution of a new epoch

128. Latour, *Facing Gaia*, 253.

129. Latour, "Drawing Things Together."

or world, and still requires an operation, of solidarity or sovereignty respectively, engendering a new topos or topology that houses entities left roaming during the Holocene. This topology to come has consequences for the place of science in any future metaphysical system: no longer can it be considered an a priori reliable indicator functioning as a beacon of truth in the quest for terrestrial survival, but, by the same token, neither can its place be fully mapped by deconstructively presupposing it an instrument wielded by powerful Holocenic geopolitical actors. Gaia renders both these positions untenable yet in so doing confronts any philosophical and scientific account of the Anthropocene with the following: as the benchmarks of modernity shrivel, the metaphysics of science and its place in the world must be thought anew.

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