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Abstract:

In response to the rise of interest in the notion of the planetary among environmental historians and philosophers, and likewise reacting to the current wave of interest in returning to space and the proclaimed birth of Space 2.0, this essay considers the somewhat provocative question as to whether we have indeed ever been planetary. The answer that we offer is no. We support this claim based on historical considerations on the inseparability of our current understanding of the planet with the human expansion into outer space. Stated rather more precisely, but also somewhat paradoxically: humankind only became aware of itself as a planetary species by becoming a post-planetary species. Our argument then is that the current rhetoric proclaiming that we live in a planetary age needs to be revised to take into account the extra-planetary dimension in our supposedly planetary existence. The remainder of the essay attempts to rapidly sketch what it might mean to begin to think critically about our current historical situation in post-planetary terms, with a particular focus on culture, ecology, economics, and politics.

Many philosophers, historians, and critical theorists are now telling us that we live in a planetary age, characterized by a planetary consciousness and a need to confront planetary challenges such as global climate change.¹ Arguably, the birth of this planetary age, what Alexander Geppert has

¹ The number of texts articulating this perspective is literally overwhelming. An incomplete selection might include: William Connolly, *Facing the Planetary*, (Duke University Press: Durham, 2017). Lukáš Likavčan, *Introduction to Comparative Planetology*, (St. Petersburg, Strelka Press, 2019). Gayatri Chakravorty Spivak, “Imperative to Re-Imagine the Planet”, in *An Aesthetic Education in the Era of Globalization*, Harvard University Press, 2012, 337–338. Yuk Hui, “For A Planetary Thinking,” *eFlux Journal*, 114, December 2020, <https://www.e-flux.com/journal/114/366703/for-a-planetary-thinking/>, Ursula K. Heise, *Sense of Place and Sense of Planet: The*

alternately described as “the age of limits,” was coeval with the human arrival in space.² As the story goes, humankind arrived in space, realized that there was nothing there to rival the Earth, and went home—changed. As space historian Mariana Benjamin once remarked, it is hardly accidental that “the first Earth Day on April 20, 1970, coincided with Apollo’s return to Earth.”³ Yet if it is true that the birth of planetary consciousness was aligned with a cooling of ardor for going to space, it is also true that the space age never really went away, and humankind never really returned from space. The space dream lived on. To some extent space went underground—cyberspace largely absorbed outer space in the science fictive imagination of the eighties and nineties.⁴ But space settlement advocacy groups such as the National Space Society

Environmental Imagination of the Global (New York: Oxford University Press, 2008). Baird Callicot, *Thinking Like a Planet: The Land Ethic and the Earth Ethic* (London: Oxford University Press, 2013). Dipesh Chakrabarty, *The Crises of Civilization: Exploring Global and Planetary Histories* (New York: Oxford University Press, 2018). Bruno Latour, “Conflicts of Planetary Proportions,” *Journal of the Philosophy of History*, 14(3) 2020, 419–454.

² Alexandre Geppert ed., *Limiting Outer Space: Astroculture after Appollo* (London, Palgrave, 2018).

³ Mariana Benjamin, *Rocket Dreams*, (New York: Free Press), 2003, 4.

⁴ This connection is made by Bruce Clark, who has pointed out that cyberpunk visionary William Gibson “liberally helped himself to these goodies [Gerard O’Neill’s language and plans for space colonies] and recycled NASA’s gorgeous depictions straight into the high-orbital storyworld of *Neuromancer*.” See Bruce Clark, *Gaian Systems*, (Minneapolis: University of Minnesota Press, 2020, Kindle Edition) 224.

(NSS), the Space Studies Institute (SSI) and the Mars Society persisted. The ISS is 30 years old, and NASA continues to send drones, probes, rovers, and yes, the occasional manned rocket, up into space. In fact, so many satellites have now been put up into orbit that space junk has become a major issue.⁵ Recently, however, the space age has been proclaimed to be reborn as “New Space” or “Space 2.0.”⁶ According to this version of the tale, Space 2.0 is what happens when space is open “for business,” when it is not countries sending up rockets in a struggle for political glory but rather “rocket billionaires” rivalling to be the first space economy trillionaires.⁷ Yet if this is in part true, it is also true that it is not only private industry that is investing in space.

⁵ Though many scientific treatments of this issue exist, a particularly recommended—and fascinating—text is Alice Gorman’s, *Dr. Space Junk Versus the Universe* (Cambridge MA: MIT, 2019).

⁶ On New Space, see Xavier Pasco, *Le nouvel âge spatial. De la Guerre froide au New Space*, (Paris: CNRS, 2017). The moniker Space 2.0 is proposed by Rod Pyle, *Space 2.0: How Private Spaceflight, a Resurgent NASA, and International Partners are Creating a New Space Age* (New York: Ben Bella, 2019).

⁷ The claim that space is now “open for business” comes from Donald Jacobson, *Space is Open for Business*, (Los Angeles: Donahue Group, 2020). More substantially, the conditions for this opening were laid by the passing of the 2015 “Commercial Space Launch Competitiveness Act,” by the U.S. Congress and the pursuit of similar legislation elsewhere (notably in Luxembourg). The term “rocket billionaires” comes from Fernholz, who profiles each of these figures and their space expansionist ambitions in his *Rocket Billionaires: Elon Musk, Jeff Bezos, and the New Space Race*, (New York: Houghton Mifflin, 2018).

China has proclaimed that it is building a “silk road to outer space,” and has made a space power a major developmental priority.⁸ The UAE, India, and the EU are all pouring money into space, while the US and Russia, long the leaders in space expansionism, continue their presence in space. According to the current timeline, NASA’s project Artemis will return astronauts to the moon by 2024 and will establish a permanent base camp near Shackleton crater soon thereafter. Taking all of this into account, the current calls to recognize that we live in a planetary age seem oddly out of date. Not only does our planetary age seem to be already one in which humankind is expanding at least its ecological footprint, its economy, and its political struggles out into space and beyond the planet, but it paradoxically seems that from the very first moment in which humankind became planetary, we were always already post-planetary, always already out in space. In light of these renewed efforts to return to space, and likewise in light of current

⁸ Space historian Brian Harvey claims that if the US-Russia space race was “was the space story of the 20th century, then the emergence of China as a spacefaring nation was the story of the early 21st century.” Simply put, China has invested heavily in becoming a space power, even openly declaring on its official web site that the new silk road will go to the moon. Brian Harvey, *China in Space: The Great Leap Forward*, (New York: Springer International Publishing, 2013) Kindle, loc.29. China declares that the silk road will go to the moon on the web page associated with their Belt and Road Initiative: <https://www.beltroad-initiative.com/space-silk-road/>

theoretical investments in the notion of the planetary, it seems appropriate to look back, historically and critically, on the origins and destiny of the planetary age.

The Deceptions of the Moon and the Birth of the Planetary Age

The mythic founding moment to the planetary age seems to have coincided with a feeling of disappointment that collectively accompanied the arrival on the moon. This was an event that was televised worldwide, the culmination of one of the most impressive and concerted technological projects in the history of humankind. But despite all of this effort, the arrival in space has long been narrated as a moment of shattering deception which in turn ushered in what Geppert has called a “reversal” or a “reconfiguration” of the Astrocultural imaginary.⁹ In essence, and despite the accumulation of decades of evidence to the contrary, it seemed that before Apollo actually landed most everyone still supposed that something wonderful awaited on the moon, something to justify the effort and expense of getting there, something to meet the expectations of many centuries’ worth of rhetoric and dreams about the riches of space. But what the astronauts, and the television viewers, saw in space was a spectacle of banality. The astronaut Bill Anders, the man responsible for the famed “Earthrise” photograph that graced the cover of the *Whole Earth*

⁹ Geppert, *Limiting*, loc.415.

Catalog and which became an icon of the very idea of planetary consciousness, described the Moon as “a dirty beach...with lots of footprints on it,” noting that it lacked “definition” and was made up of nothing but “bumps and holes.”¹⁰ Yet if space was a bore, the sight of Earth from space was by general consensus a revelation. Frank Borman, a member of the Apollo 8 mission, claimed that Earth seen from space was “the most beautiful, heart-catching sight of my life, one that sent a torrent of nostalgia, of sheer homesickness, surging through me. It was the only thing in space that had any color to it. Everything else was simply black or white. But not the earth.”¹¹ Upon arrival in space, up became down and down up, the cosmos—despite the meaning of its name—seemed ugly and disorderly while the Earth—long imaginable as “the excrement of some sky”—suddenly appeared as a blue pearl.¹² Dick Gordon summed up this reconfiguration perfectly when he claimed: “what we discovered when we went to the Moon...was the Earth.”¹³

¹⁰ Quoted after Benjamin, *Rocket Dreams*, 49.

¹¹ Benjamin, *Rocket Dreams*, 48.

¹² William Carlos Williams, “To Elsie,” in *The Collected Poems: Volume I 1909-1939* (New York: New Directions, 1986) 217. The point about the cosmos as beauty and the discovery of the blue pearl owes a debt to the extended discussion of the history of the idea of the cosmos in Jacques Arnaud, *Une perle bleue: La Terre, l'espace et le changement climatique* (Paris: Le Cerf, 2015) kindle loc. 353-550.

¹³ Benjamin, *Rocket Dreams*, 49.

So powerful was the shock of this conceptual reversal that Frank White proposed a theory of what he called the “overview effect,” a near-religious conversion experience through which was born a new “self-awareness” and a belief in a “planetary civilization” united by “one species’ destiny.”¹⁴ But you did not need to actually go up into space to experience the overview effect. Indeed, almost the entirety of humankind seemed to undergo the same transformation. Hans Blumenberg, arguably the greatest German philosopher of the post-war era, claimed that what the moon landing provided was “optical evidence” that Earth was the “cosmic exception.” Seeing those “pitted crater worlds” and “smoldering embers without any sign of possibility for life” confirmed that humankind was alone in the universe, and that the sole place where humankind could dwell was planet Earth.¹⁵ In his poem *Voyage to the Moon*, American poet laureate Archibald MacLeish began by channeling traditional cosmic expectations and symbols, describing the moon as a “light beyond our lights, our lives,” a beacon of hope and an object of desire. Yet upon arrival, what is discovered is “cold” “death” and “unfathomable emptiness.” But, with the volta of the poem a new light arises: that “wanderer in her sky” comes into view, the Earth, a “wonder to us past the reach of wonder/a light beyond our lights, our lives, the

¹⁴ Frank White, *The Overview Effect*, (Washington: American Institute of Aeronautics and Astronautics, 2014), 98.

¹⁵ Hans Blumenberg, *Genesis der Kopernischen Welt* (Frankfurt am Main: Suhrkamp, 1982) 787.

rising/earth/a meaning to us,/O, a meaning!”¹⁶ It is perhaps this “meaning” that best articulates the essence of what might be called the planetary age, that period in human history which emerged after men went to space, saw the Earth from outside, and determined that the only thing that mattered, the only thing that really was, was the planet.

In 1969, the astronaut David Collins remarked that seen from space, the Earth was so small that he could “blot it out” simply by holding up his thumb.¹⁷ If Earth was suddenly reborn as a paradise, it was almost immediately also perceived to be fragile, endangered, and on the verge of being lost. The authors of *Our Common Future*, the first UN report on Sustainable Development, began with an evocation of seeing “our planet from space for the first time”—then went on to argue that this event “had a greater impact on thought than did the Copernican revolution,” directly passing from this figure of existential re-centering to the observation that humankind is “changing planetary systems fundamentally,” and that this “new reality, from which there is no escape, must be recognized - and managed.”¹⁸ The general idea put forward by the new planetary consciousness was, as David Attenborough was later to put it, that “there was an edge to our

¹⁶ Archibald Macleish, *Collected Poems* (New York: Houghton Mifflin, 1990), 17-18.

¹⁷ Cited after Carmen Cosgrove, *Apollo's Eye* (New York: Johns Hopkins University Press, 2001), kindle loc. 4641.

¹⁸ Brundtland, G. H. et al., *Our Common Future*, Oxford, Oxford University Press, 1987.

existence,” that living on a planet was to live on a finite, fragile, and deeply constrained world.¹⁹ Perhaps no text set out this planetary limit thinking more memorably and controversially than the 1972 publication of *The Limits to Growth*.²⁰ *Limits* popularized the results of the first planetary-scale modelling of the current growth trends, and in doing so it demonstrated that the Earthly paradise that had just been discovered was already on its way to towards overstepping its limits and so plunging into catastrophic ruin. This tale of coming planetary tragedy has persisted over the last fifty years, with the most recent version being the Anthropocene narrative, which goes beyond *Limits* in envisaging the coming collapse as affecting not only human civilization, but also the planet itself, ushering in pleas for us to recognize how the “telluric force” of humanity is putting at risk the future of all life on Earth.²¹ The most recent visions of the planet see it as caught up in a “great acceleration” (McNeill and Engelke) of technology-driven change, which

¹⁹ David Attenborough: *A Life on Our Planet*. Directed by David Attenborough. 2020. [Film]

²⁰ Donatella Meadows, Meadows, D., Randers, J. & Behrens, W., *The Limits to Growth* (New York: Universe Books, 1972).

²¹ Clive Hamilton, Christophe Bonneuil and François Gemenne, “Thinking the Anthropocene,” in eds. Clive Hamilton, Christophe Bonneuil and François Gemenne, *The Anthropocene and the Global Environmental Crisis: Rethinking modernity in a new epoch* (London: Taylor and Francis, 2015), 3.

has prompted Amanda Lynch and Siri Veland to proclaim that we now live in a “new and ostensibly global state of urgency,” one in which the time to save the planet is running out.²²

In response to these rapid changes, we have been told to strive to develop “planetary consciousness” or to learn how to “think like a planet.”²³ But many seem to feel that this is too little and too late. The environmental activist Bill McKibben has already proclaimed that the blue pearl that we discovered from space is already gone. In his opinion, “we no longer live on that planet”—the Earth—but rather on a “tough new planet”: -- “*Eaarth*.”²⁴ Accompanying this proclaimed end of the Earth has welled up wave after wave of literature documenting the blue pearl’s—and our own—coming doom, works with titles like *The Uninhabitable Earth* and *The*

²² J. R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene Since 1945*, (London: Harvard Belknap, 2014). Amanda Lynch and Siri Veland, *Urgency in the Anthropocene*, (Cambridge MA: MIT Press, 2019), 9.

²³ For example, in 2008, Ursula Heise suggested that we needed to develop a sense of planet, a “holistic understanding of ecological connectedness, as well as the risks that have emerged from human manipulations of such connected systems.” Baird Callicot, for his part, attempted to develop the Leopoldian land ethic in the direction of a broader planetary thinking, capable of encompassing the larger temporal and spatial scales involved in global climate change. See Heise, *Sense of Place and Sense of Planet*, 22. Also Callicot, *Thinking Like a Planet*, 5.

²⁴ Bill McKibben, *Eaarth: Making a Life on a Tough New Planet*, (New York: Henry Holt, 2010), 2.

Sixth Extinction Event.²⁵ Confronted with all of this catastrophe, hearts and minds are once again turning back to space. Jeff Bezos is claiming that any future in which humankind would be restricted to planet Earth would be characterized by “stasis and rationing” due to the limits of the planet, and that by tapping into the “unlimited resources of space” we will be able to not only enjoy “dynamism and growth”; yet more importantly, he is also promising that the inhabitants of space colonies will enjoy weather equivalent to “Maui on its best day all year long—no rain, no storms, no earthquakes.”²⁶ Perhaps it is indeed the weather that is getting to us, that most direct link between the changing planet system and our day-to-day lives, changing foolish space dreams into an apparently pragmatic plan for the future.²⁷ At least that is what Jenny Offil seems to suggest in her *Weather*: “I’m starting to understand why all those people want to go to Mars. The guest today on the show is explaining that many scientists are in a state of barely suppressed

²⁵ David Wallace-Wells, *The Uninhabitable Earth*, (New York: Crown, 2019). Elizabeth Kolbert, *The Sixth Extinction: An Unnatural History* (New York: Henry Holt, 2014.)

²⁶ Jeff Bezos, *Invent and Wander*, (London: Harvard Business Press, 2021), 248.

²⁷ On the link between weather and the direct experience of climate, see Mike Hulme, *Weathered: The Cultures of Climate Change*, (London: Sage, 2017).

panic about the latest data coming in. Their previous models were much too conservative. Everything is happening much faster than expected.”²⁸

The Planetary as Absolute Metaphor

Tim Morton has argued that the “end of world has already occurred.”²⁹ This does not mean that we no longer live, or that there is no longer a world, but that a certain image of the world, the planetary world that was discovered from outer space, is perhaps already gone. The rebirth of interest in space precisely indicates that for many of us that perfect planet is no longer receivable as the site of all meaningfulness in the universe. The planet is no longer the world. The planet no longer functions, to borrow a term from Hans Blumenberg, as an “absolute metaphor,” a figural presentation of the absolute.³⁰ To explain absolute metaphors through a metaphor, they are the “underground” and the “nutrient solution” out of which emerged the “crystallizations” of a new

²⁸ Jenny Offill, *Weather*, (New York: Knopf, 2020), loc. 641.

²⁹ Tim Morton, *Hyperobjects: Philosophy and Ecology after the End of the World*, (Minneapolis: University of Minnesota Press, 2013, Kindle) loc. 207.

³⁰ Hans Blumenberg, *History, Metaphors, Fables*, edited and translated by Hannes Bajour, Florian Fuchs, Joe Paul Kroll, (London: Cornell University Press, 2020), 173

world.³¹ As Blumenberg explains, absolute metaphors are the “foundational elements of philosophical language,” they make present what is, rescuing it from a sublimity that would make it unrepresentable and unimaginable, giving it limits and an outline.³² But they are also, and ever, metaphors, mis-uses of language, improper expressions that only relatively render that which they strive to denote. This fact means that the structures, and that is to say the worlds, built upon metaphors are also unstable, they are easily undone.

Within the planetary age, what the planet figures simply *is* the whole. Everything beyond or outside of the planet is a figure for nothing: null and void. Any claims to present this outside as real or relevant seem meaningless, irrational, or absurd. The idea that the planet is the absolute lies behind the consensus reading of the *Earthrise* photo. In it we see a picture of what *is*—the planet—surrounded by black nothingness—what *is not*. The same idea is expressed in the nearly universal practice of opposing the global (or the planetary) and the local, since the dialectical opposition precisely expresses an equivalence between the universal and the planetary within the

³¹ Blumenberg, *History*, 176.

³² Blumenberg, *History*, 173.

Hegelian dialectical of the universal and the particular.³³ Yet we can easily show that this planetary vision is but a gestalt, a metaphor for the photograph. Within the Earthrise photo there is what Don Ihde would call “bivariational ambiguity.”³⁴ In other words, we can perfectly well read the photo as showing that the photographer is *in that nothingness*, and so find in it a demonstration that an obscure outside surrounding the Earth perfectly well exists, *that it is a meaningful place and has already been part of our world*. We can further push our awareness of the metaphorical nature of our sense of the planetary absolute by reflecting on how much of our knowledge of the planet implies the existence of extra-planetary entities, for example the Earth observation satellites that have provided the data for mapping and making sense of the planetary system, or the interplanetary probes that have made comparative planetology possible, thus giving birth to theories such as Lovelock’s Gaia hypothesis.³⁵ Further shaking our sense of the planetary absolute we can recall that we need not look out but down into the Earth at our feet to

³³ This is the case, for example, in Ursula K. Heise’s *Sense of Place, Sense of Planet*, a text that is well worth consulting in this regard given that the opening pages contain an extended critical discussion of multiple other texts which likewise reflect this tendency to establish an equivalency between the planet and the absolute. See Heise, *Sense of Place*, 7-67.

³⁴ Don Ihde, *Experimental Phenomenology: Multi-Stabilities*, (Albany: SUNY Press, 2012), 145.

³⁵ On Lovelock and comparative planetology, see James Lovelock, *Gaia: A New Look at Life on Earth*, (London, Oxford University Press, 1979).

rediscover the inadequacy of the planetary as a figure for the whole, since in the fossil traces indicating the causes of Cretaceous-Tertiary extinction that wiped out the dinosaurs we also find evidence of comet's having collided with the Earth.³⁶ Forcing ourselves to undergo this exercise yields peculiar results. We can perfectly well recognize that the planet is not all that is; yet based upon what we can see from the image, as well as on the testimony of those who have seen for themselves, we have little sense of what else might be meaningful. We have shifted from a planetary gaze to a post-planetary one, such that what we now see in Earthrise is *not being and nothingness*, but rather an image of *what was and something else that is more than nothing*, yet *less than a clearly figured absolute*.³⁷ One might say that we can now look at a project like Jeff

³⁶ Luis Alvarez, Alvarez, W., Asaro, F. & Michel, H. V., « Extraterrestrial Cause for the Cretaceous-Tertiary Extinction,” *Science*, 6 June, 208(4448), 1980, 1094-1108.

³⁷ The same sort of shift occurs when we study other figures for the planetary, for example the now somewhat dated idea that we live on “spaceship Earth,” or the still widespread utilization of the older figure of the global. As is obvious, spaceship earth is not only a metaphor, but also implies that living on our planet demands creating a hermetic barrier between our dwelling place and a very real and very menacing extra-planetary outside through which we travel. Similarly, the idea of the globe or the global, generally used to express the idea of a total political “interdependence” among nations due to networks and “global” markets, is precisely post-global not only because the age of globalization has also been the age of extra-global space expansionism, but also because the very metaphor of the Earth as globe, and that is to say as being like a spherical world map, precisely suggests its

Bezos' vision of future cities in space as something that might actually happen, but what we cannot yet believe is that whatever they will be like would be better than the planet which we seem to have lost. We are, as I have said, post-planetary. To be post-planetary is not to be a dweller in the planets of the "expanse" imagined by S.A. Corey, nor is it to live in the "multi-planetary" future dreamed of by Elon Musk, or even to be freed of the "planetary chauvinism" criticized by Bezos.³⁸ To be post-planetary is to live in a world in which the insufficiencies of the planetary framing of reality have become unmistakable, but also to live in a world in which no alternative absolute metaphor is manifest.

Accepting that the planetary world is and has always been a metaphor, a partial framing of reality, is in no way to discredit the value of the planetary. Indeed, there is no escaping the metaphorization of the absolute, there is no absolute that is not also an absolute metaphor. This is

metaphorical nature in situating the analyst in a post-planetary position equivalent to that of the astronaut seeing the Earth from space. Buckminster Fuller, *Operating Manual for Spaceship Earth*, (Zurich: Lars Muller, 2015).

³⁸ In *Leviathan Wakes*, the world is described as composed of Earth and Mars, the Belt and the Outer Planets, though the whole is "the planets," as illustrated in the phrase: "The Epstein Drive hadn't given humanity the stars, but it had delivered the planets." S.A. Corey, *Leviathan Wakes*, (New York: Little, Brown Book Group, 2011, Kindle Edition), 7. Musk discusses his vision of a multiplanetary civilization in Elon Musk, "Making Humans a Multi-Planetary Species," *New Space*, 5(2), 2017, 46-61. On Asimov and planetary chauvinism, see Bezos, *Invent & Wander*, 248.

not so much an existential catastrophe, an incurable deprivation from truth—as it is an indication regarding how we need to think about and evaluate the planetary. Simply put, truth and falsity are not the proper criteria for judging absolute metaphors.³⁹ To borrow a term that Thomas Kuhn used to talk about scientific paradigms, we might say that the criteria for judging absolute metaphors, is “*future promise*,” by which we mean the likelihood of any absolute metaphor to foster life and growth, to generate a future world in which we would wish to live.⁴⁰ Yet since we cannot yet know the future of the non-planetary, or yet even of the post-planetary, let us at least look back on what the planetary framing of reality has wrought.

³⁹ For example, in Blumberg’s 1981 book, *Die Lesbarkeit der Welt*, a historical study of the absolute metaphor of the *world-as-a-book* shows that, even using this somewhat absurdly false figure for the world—the idea that it is somehow made of paper and covered with ink—generated an incredibly fertile frame for making sense of the world, contributing mightily to the growth of modern science, up to and including the discovery of DNA. Hans Blumenberg, *Die Lesbarkeit der Welt*, (Frankfurt a.M.: Suhrkamp, 1981).

⁴⁰ Kuhn employs the idea of “future promise” in the context of his discussion of how and why one paradigm is chosen over another given that, because paradigms are incommensurable, there can never be a “matter of proof,” and in light of the fact that the promise of a paradigm—namely the discoveries that will be made in that paradigm—cannot proceed but rather must follow from its embrace as the normal scientific paradigm. Thomas Kuhn, *The Structure of Scientific Revolutions*, (London: University of Chicago Press, 2012), 156.

The Terraforming

Benjamin Bratton provocatively uses the term “terraforming”—initially baptized to describe the transformation of Mars and other planets into the Earth-like places—to describe not just the ecological transformation of the Earth carried out by contemporary technological mediation, but also to illustrate the world-forming power of the data and information, the world picture, provided by the same.⁴¹ What this terraforming assemblage has accomplished from the sixties to the present is nothing less than transforming the meaning of the planetary from a data-poor analogue image, a “world picture,” into a dynamic and data-rich planetary model.⁴² Over the same period, we have passed from merely seeing the Earth from space, to measuring and analyzing it using vast arrays of what Jennifer Gabrys has called “environmental sensing” technology. At our present point in the terraforming, the planetary model now integrates not only information about climate change, but also about species migrations, habitat and biodiversity loss, diminishing arctic ice cover, changing weather patterns and ocean currents, and suffering

⁴¹ Benjamin Bratton, *The Stack: On Software and Sovereignty*, (London: MIT, 2015, kindle) loc. 2019, loc.230.

⁴² On the idea of the world picture, see: Bernard Lazier, *Earthrise; or the Globalization of the World Picture*. *American Historical Review*, 116(3), 2011, 602-630.

and dying people.⁴³ While Bratten himself defines “the stack” as planetary, it would be more precise to say that the technological infrastructure responsible for gathering data and hence terraforming the Earth is both planetary and extra-planetary, indeed that it is distributed throughout the solar system. Yet this extra-planetary dimension in our model of the planet has rarely been sufficiently appreciated. James Hansen would never have testified before the US Congress on climate change if NASA, reacting to the great disappointment of lunar arrival, had simply stopped sending up missions into space.⁴⁴ But the aim of these space missions, as Sally Ride put it, was to accomplish “Mission to Planet Earth,” in other words, to use space technology to study and observe the Earth.⁴⁵ Likewise, Lovelock would never have conceived of the figure of Gaia without the data obtained via JPL (Jet Propulsion Laboratory) probes sent to Mars and

⁴³ Jenifer Gabrys, *Program Earth: Environmental Sensing Technology and the Making of a Computational Planet*, (Minneapolis: University of Minnesota Press, 2018), 4.

⁴⁴ Erik Conway’s work fascinatingly documents the leading role played by NASA science and technology in the development of our understanding of planetary climate change. See Erik Conway, *Atmospheric Science at NASA: A History*, (Baltimore: Johns Hopkins University Press, 2008).

⁴⁵ The parameters and objectives for this mission were clearly laid out in the so-called “Ride Report.” See: Sally Ride, *Leadership and America’s Future in Space: A Report to the Administrator*, (Washington: NASA Press, 1987), esp. 23-26.

Venus.⁴⁶ The terraforming was thus never a planetary phenomenon, but was rather the product of a decision to impose a planetary hermeneutic framework on data gathered from across the solar system. As Dipesh Chakrabarty has noted, the planetary science to which we owe our picture of the planetary “necessarily has other planets in view.”⁴⁷ The planet was a product of a choice to interpret a mass of data obtained in extra-planetary sites in planet-centric ways, following the assumption that the Earth was indeed all that mattered, and that it was perhaps not the “first time a species has changed a planet’s climate through its own success.”⁴⁸ Yet behind this interpretative choice lay a deeper reality: the terraforming of planet Earth has always in myriad ways been an extra-planetary or post-planetary affair, carried out with data obtained beyond the Earth, by a species that had proven itself capable of leaving its planet.

⁴⁶ Lovelock states quite explicitly the interdependency of origins of the Gaia theory and the extra-terrestrial: “It came to me suddenly one afternoon in 1965 when I was working at the Jet Propulsion Laboratory (JPL) in California. It came because my work there led me to look at the Earth’s atmosphere from the top down, from space.” James Lovelock, *Gaia*, loc. 180.

⁴⁷ Dipesh Chakrabarty, “The Planet: An Emergent Humanist Category,” *Critical Inquiry* 26, 2019, 1-31, 11.

⁴⁸ Adam Frank, *Light of the Stars: Alien Worlds and the Fate of the Earth*, (New York: W.W. Norton and Company, 2018), 6.

The terraforming has not just yielded a new model of the world, but also a new way of being in the world. Yet this way of being is asymmetrical with the means that have made terraforming possible insofar as planetary consciousness has largely treated outer space as exterior to being and hence meaningless. Yet before dwelling on this point, let us reflect upon what it means to be planetary today, tracing out the current contours of the planetary subject. Out of the myriad starting points that we might choose to illustrate this, the following lines from Kim Stanley Robinson's recent novel *The Ministry of the Future* offer a promising starting point. The narrator—Frank—a figure who re-appears in many of Robinson's books as the voice of the scientific rationalist, and arguably as the voice of the author himself—describes what he calls the “everything feeling:” “A new feeling, or a new blend of feelings, bitter and dark. Caffeine and alcohol. Uppers and downers. Lots of everything.”⁴⁹ This whirl of emotions—predominantly bitter and dark, but also exhilarating—seems to perfectly evoke terraformed being, what Heise has called the “sense of planet.”⁵⁰ Most of us recognize the elements, the uppers and the downers, of which Robinson speaks. We experience joy when we notice the beauties of our planet, perhaps comparing these favorably with the stark desolations that we first observed on the moon. We also feel connected in new ways, we form part of a small big world, a global village. Perhaps more

⁴⁹ Kim Stanley Robinson, *The Ministry of the Future*, (London: Orbit, 2020), 394.

⁵⁰ Heise, *Sense of Place, Sense of Planet*, 22.

pragmatically, at least if we are speaking as ecologists concerned about the fate of the planet, we have also learned new ways of relating to the world through the frame of the planet. As Mitchell Thomashow has explored, we can now experience an immediate and joyous perceptual event like the singing of the spring peepers as a local status report on the global effects of climate change.⁵¹ We can likewise acknowledge the ways that the terraforming has impinged on and changed our relations to ordinary things. We have planetary consciences. Increasingly widespread are reports of people feeling guilty when they engage in practices that endanger the planet. We feel shame when we fly, eat meat, or use disposable cups.⁵² More generally speaking, environmental psychologists such as Glenn Albrecht have begun to diagnose an increasingly detailed list of “earth emotions,” feelings and experiences which are emergent products of the feedback loops that inform our awareness of our existential entanglement with the changing Earth.⁵³ Some of these emotions are joyous, but it is to the bitter and dark ones that we now turn, since the ultimate

⁵¹ Mitchell Thomashow, *Bringing the Biosphere Home: Learning to Perceive Global Environmental Change*, (Cambridge MA: MIT Press, 2002, Kindle) loc. 286-700.

⁵² On coffee cup guilt, see Rebeca Huntley, *How to Talk about Climate Change in a Way that Makes a Difference*, (London: Murdoch Books, 2020, Kindle), locs. 52-1098.

⁵³ Glenn Albrecht, *Earth Emotions: New Words for a New World*, (London: Cornell University Press, 2019, Kindle).

value of the planetary as an absolute metaphor depends upon its ability to foster life as opposed to collective self-destruction.

One particular source of concern is the “inter-related and metastasizing” phenomenon that Albrecht calls “global dread.”⁵⁴ Global dread is a kind of psychological cancer stimulated within the human psyche by contact with the planetary. While many of us suffer from climate anxiety and even from feelings of our own powerlessness when in the grip of planetary awareness, what in another register William Connelly calls “passive nihilism,” the slippage into global dread involves flipping over into “active” nihilism: affirmatively “doubling down on the exact activities that exacerbate the problem” in a perverse attempt to rescue a sense of planetary agency via the misguided desire to prove that the planet is nothing.⁵⁵ In more concrete terms, those afflicted with global dread grasp at “anything that makes the journey either smoother or faster.”⁵⁶ They embrace escapisms of all types. They deny climate change, they become anti-environmentalists and actively try to trash the Earth. They vote for Trump. They openly express their hatred of the Earth, claiming that they want to “die on Mars,” actively engaging in projects to become a multi-

⁵⁴ Albrecht, *Earth Emotions*, loc. 168.

⁵⁵ William Connelly, *Facing the Planetary*, 165.

⁵⁶ Albrecht, *Earth Emotions*, loc.1668.

planetary species.⁵⁷ The fantasies of those suffering from global dread sometimes take perverse and even laughable forms. In journalist Charles Wohlforth and planetary scientist Amanda Hendrix's recent book, *Beyond the Earth: Our Path to a New Home in the Planets*, they present a great mass of astrobiological evidence to argue that our ancestors will live on Titan, the largest moon of Saturn, because it possesses an "unlimited supply of fossil fuels," and a "cold" atmosphere.⁵⁸ In other words, and in a parodic confirmation of Stephanie LeMenager's suggestion that Americans are "living oil," Titan has become attractive because it would allow the petroleum-based existence that is responsible for so many of the changes to the planet to become sustainable and even redemptive, since by changing planets, burning fossil fuels and thus "globally warming" Titan would positively contribute to the flourishing of life on the planet.⁵⁹ Even more extreme are fantasies which imagine not only replacing Earth but rather wholly weaning humankind from planetary dependence. A most curiously perverse example of this is

⁵⁷ Elon Musk is reported as having said that he "wants to die on Mars, just not on impact." See: Daniel Terdiman, "Elon Musk at SXSW: 'I'd like to die on Mars, just not on impact' CNet, March 9 2013, <https://www.cnet.com/news/elon-musk-at-sxsw-id-like-to-die-on-mars-just-not-on-impact/>

⁵⁸ Charles Wohlforth and Amanda Hendrix, *Beyond the Earth: Our Path to a New Home in the Planets* (New York: Knopf, 2016), 3.

⁵⁹ Stephanie Lemenager, *Living Oil: Petroleum Culture in the American Century*, (New York, Oxford University Press, 2014).

found in Neal Stephenson's *Seveneves*. In this book, written while Stephenson was a consultant at Jeff Bezos' Blue Origin space company, and with a great deal of input from the engineers at asteroid mining company Planetary Industries, a cosmic catastrophe occurs that renders the Earth uninhabitable, and so it is abandoned.⁶⁰ Yet sad as this event is, Stephenson presents this event as a kind of happy accident, for with the ending of the Earth begins his exposition of the wonders of the planetary civilization that he imagines will emerge in the aftermath. Stephenson never quite says that we should destroy planet Earth, but as he explains elsewhere, science fiction needs to produce "hieroglyphs," hopeful visions of the future meant to ward off "innovation starvation" and to inspire us to take the big risks that he believes are the "only way for the human race to escape from its current predicaments."⁶¹ In *Seveneves*, it is precisely the loss of everything—of the planet—that is depicted as necessary to give us hope, and to spur radical innovation.

⁶⁰ Neal Stephenson, *Seveneves*, (New York: Harper Collins, 2015).

⁶¹ This quote is from a paper discussing the need for science fiction to present us with what Stephenson describes as hieroglyphs, "plausible, fully thought-out picture(s) of an alternate reality in which some sort of compelling innovation has taken place." *Seveneves* is in some sense an illustration of this aesthetic principle, though its most compelling innovation, or rather the innovation that drives every subsequent innovation in the text, is quite simply the imagined annihilation of the human relationship to the Earth. Neal Stephenson, Innovation Starvation, *World Policy Journal*, September, 28(3), 2011, 11-16, 13.

Have We Ever Been Planetary?

Yet we need not destroy the Earth to find the hope that Stephenson seeks. We can simply strive to grasp the paradoxical fact that the planetary has always been post-planetary. Arguably, the malaise generated by the planetary condition is at least in part a function of the asymmetry between the extensions of human perception doing the terraforming—the environmental sensing technologies located not only on Earth, but also in orbit and even on Mars and various asteroids, and the terraformed image of the planetary self. Heidegger long ago pointed out that tools, while in use, withdraw from view.⁶² In the same way, the extra-planetary means with which the planet has been terraformed have tended to be forgotten within the current ecstasies of planetary conscious. It is as if the hermeneutic decision—to interpret the rest of the solar system through the filter of the planetary—has backfired, leaving us feeling trapped and hopeless. Rather than saving the Earth, it is contributing to the growth of rampant nihilism. Timothy Morton writes that there are three kinds of ecological darkness: a first discovery of darkness, then a second and

⁶² “The peculiarity of what is proximally ready-to-hand is that in its readiness-to-hand, it must, as it were, withdraw in order to be ready-to-hand quite authentically.” Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson, (New York: Harper and Row, 1962) 99.

uncanny transitional darkness, which may finally resolve into a third, harmonious or “sweet” ecological darkness.⁶³ In the same way, we can say that there are three stages in planetary being. The first involves the discovery of the planet, that recognition and idealization of the planet as all that is, with its accompanying renunciation of the dream of the conquest of space. The next stage involves crisis: it is our current stage, the period in which the reality of the planet sinks in, that dark and light, upper and downer thing replaces the idealized image of the blue marble seen from space. Yet the final sweet stage occurs when we realize that the idealized image of the planet that we have lost—the Earth that in Bill McKibben’s estimation has become Eaarth—was never the planet all along, and that the idea that there is nothing else out there was likewise an illusion. Becoming post-planetary changes nothing: we merely give up the myth of the planetary, acknowledging that when we were planetary, we were unaware of it, but just so long as we have been aware that we lived on a planet, our conditions of existence have always already been extra-planetary.

We can become post-planetary without leaving the ground, though I am far from suggesting that doing so puts us in some sort of ideal position. Perhaps breaking with the planetary may help us

⁶³ Tim Morton, *Dark Ecology: For a Logic of Future Co-Existence*, (New York: Columbia University Press, 2018) loc. 115.

to heal some of our existential wounds. At least it will aid in putting the planetary age in its proper perspective. From the post-planetary point of view our narrative of environmental decline and failure is also visible as a narrative of self-realization, a tale of a loss of innocence relative to fantasy in which our planet appeared as an impossible garden or fetishized mother. From the post-planetary point of view the asymmetry in our planetary consciousness becomes clear, and the technical media which have made possible the planetary world model come into view. Recognizing that we are a post-planetary species renders us into a new sort of amphibious thing, a being halfway between the Earth and the stars. It prompts us to recognize that the *anthropos* of the Anthropocene, that agent of planetary history, was and has always been both a post-human and a post-planetary being. This is a new and strange existential status. If developing and representing consciousness on a planetary scale was challenging, post-planetary consciousness tackles a reality that is yet more sublime.⁶⁴ Assuming our status as post-planetary beings has ecological, economic, and political implications. Admittedly, by and large humankind is still

⁶⁴ Timothy Clark, for example, has highlighted what he calls the “often counterintuitive challenges” of dealing thinking on a planetary scale. As he explains, “issues such as global warming or ocean acidification, so overwhelming in scale, can threaten to dwarf any individual or state action, even as both phenomena cannot immediately be seen, localised, or in many cases, even acknowledged.” *The Value of Ecocriticism*, (London: Cambridge University Press, 2019), 38.

living on Earth, but our ecological impact zone already extends well out beyond the planet. We can now acknowledge that what we have up to now called planetary politics actually already involves discussions over space power and the exercise of sovereignty over the moon, the asteroids, and the reachable solar system. This knowledge must reframe current discussions over the coming of a planetary climate Leviathan, since space power, and access to space resources, will play in the planetary politics of the future.⁶⁵ Likewise, discussions of planetary economics risk overlooking the fact that there already exists a space economy, and that the globalization of capital does not at all pose the same problems and promises for humankind in the global South as does the extension of capital and a robotic workforce out into space. It may seem that in making these claims we are getting ahead of ourselves. This may in part be true—but only in part. The futurist John Urry has noted that there is a “performative” dimension to certain anticipations of the future.⁶⁶ By this he means that by believing in and acting towards a certain future we have a tendency to drag that future into existence. This element of performativity is even stronger with respect to investments in technology, ideology, and capital. In other words, with respect to the future in space we should not be looking at the current state of space infrastructure, but rather at

⁶⁵ On the climate leviathan, see Joel Wainwright and Geoff Mann, *Climate Leviathan: A Political Theory of our Planetary Future* (New York: Verso, 2018.)

⁶⁶ John Urry, *What is the Future?* (London: Polity, 2016), 2.

the current billions of dollars that are being invested in its development. Taking this into account, it may be useful to imagine there is a blurred edge to the present, a sense in which the present path is already invested in Earthkind (by which I mean not just humans but the other members of our biotic community that would be required for us to survive in space) becoming post-Earthly. Far out as this sounds, there is little reason to doubt that in the next fifty years China's silk road will extend to the Moon, that robotic mining probes owned by American entrepreneurs will engage in extractive activities throughout the near solar system, and that sections of the Earth will be climate-controlled via installations in space. Moreover, a vision of the world that is purely planetary, that believes that only planetary economy, planetary politics, and planetary ecology exist can have nothing to say about these developments. If the planet is the universal, and our homes and lives are the particular, then extractive zones in space simply don't exist. From the point of view of the planetary vision of the world, the fact that the world's two richest men, Jeff Bezos and Elon Musk, are investing billions of dollars a year in the space economy is a product of their own delusions of grandeur, with no real political or other consequence. Yet what happens if they are right about space? What happens if these men, whose incomes are already equal to that of many countries, become rocket trillionaires, with individual incomes to rival even the largest nations? What if the reason why Bezos and other internet billionaires are investing in space is not because they are sci-fi geeks who cannot tell speculation from reality, but because they see

perfectly clearly that the data network infrastructure that has made them rich is already partially extra-terrestrial? There is very little reason to believe that there will be no human—or at least post-human—future in space, but even if there were to be no future in space, our post-human present has already been profoundly informed by our expansion out into space. The reason why we do not see this is more perplexing. It seems that we have taken an astronaut's testimony as gospel, forgetting that we too, with respect to both our prosthetic bodies and senses, and with respect to the ways in which we see ourselves, are extended out into space. It seems that we are perhaps excessively fearful of being mocked for confounding science fiction with reality, without recalling the degree to which that which we call reality is a sort of fiction grounded on science. Or perhaps we quite simply (and doubtless rightly), believe that it would have been better to just stay on planet Earth. Yet we have not done that, and it is time to start thinking about what that means.