Hatred of the Earth: Climate Change and Post-Planetary Culture

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Abstract

This text examines the effects of climate change on cultural ideas regarding the colonization of space. More specifically, this paper explores the ways which the looming danger of climate catastrophe has fueled the growth of post-planetary culture: a culture that dreams of a human destiny beyond the Earth. It takes as its object both science fiction texts and non-fiction futurological pronouncements by scientists and entrepreneurs. What emerges from this study is the observation that unlike climate skeptics, post-planetarists believe that climate change is real. Yet like climate skeptics, they subordinate climate action to other priorities, putting the construction of a means of escaping this planet above climate action. But why do these post-planetarists wish to fly? Via a close reading of David Brin's *Earth*, we argue that one of the key characteristics of post-planetary culture is a feeling of hatred and alienation towards the Earth. This hatred is both re-enforced by the ravages of climate change even as it contributes to this destruction by blocking post-planetarists from whole-heartedly engaging in climate action. In order to illustrate an antidote to this pathological cultural reaction to our current crisis, I present a close reading Kim Stanley Robinson's *Aurora*, exploring how this text is both a critique of post-planetarism and a guide to renewing our love for the Earth.

Keywords: Post-planetarism, climate change, ecocriticisim, David Brin, Gregory Benford, Kim Stanley Robinson, science fiction.

Resumen

El texto examina los efectos del cambio climático en ideas culturales en torno a la colonización del espacio. El artículo explora especialmente las formas en que el peligro inminente de una catástrofe climática ha alimentado el crecimiento de una cultura post-planetaria: aquella que sueña con un destino humano más allá de la Tierra. Se centra tanto en textos de ciencia ficción como en proclamaciones futurológicas de no-ficción publicadas por diferentes científicos y emprendedores. Así, se observa que, al contrario que los negacionistas climáticos, los post-planetaristas sí creen en la realidad del cambio climático. No obstante, al igual que los primeros, estos subordinan la protección del clima a otras prioridades anteponiendo, por ejemplo, la construcción de un medio para escapar de este planeta a la protección del clima. Pero, ¿por qué desean volar los post-planetaristas? Profundizando en la obra *Earth* de David Brin, se argumentará que una de las características clave de la cultura post-planetaria consiste en el desarrollo de un sentimiento de odio y alienación hacia la Tierra. Este odio se ve reforzado por las devastaciones del cambio climático, aunque sea este mismo el que contribuye a la destrucción de la Tierra impidiendo a los post-planetaristas comprometerse incondicionalmente con la protección del clima. Como antídoto contra esta reacción cultural patológica hacia nuestra crisis actual, se realiza un análisis de *Aurora* de Kim Stanley Robinson que pretende abordar el texto como una crítica al post-planetarismo y como una guía para renovar nuestro amor hacia la Tierra.

Palabras clave: Post-planetarismo, cambio climático, ecocrítica, David Brin, Gregory Benford, Kim Stanley Robinson, ciencia ficción.

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Introduction

Why attempt to colonize space? The answers have ranged from reinforcing faith in the power of human ingenuity to fueling economic growth and garnering political glory. People have hoped to go to space in the name of adventure, once there they have hoped to find aliens or financial opportunities, have hoped to establish mining colonies or to found starlit resort hotels. Extending the human habitat into space is seen as a means of protecting humankind against all sorts of existential risks, including pandemics, nuclear holocausts and asteroid strikes. Environmental concerns have also driven humans to wish to expand their lifeworld out into space. Resources found in space promise to resolve the planetary-limits problem highlighted by sustainable development advocates. Space will permit the perpetuation of the growth and production-oriented paradigm of capitalism. Yet space colonization is not only seen as providing a lifeboat against the unsustainability of the economy. Increasingly, humans have been imagining the conquest of space as a response to climate change and the threats that it poses to the future of life on this planet. As despair over our collective failure to slow climate change has grown and the risk of a climate-related catastrophe has augmented, so too has flourished a cult and culture of what we call the post-planetary, a culture brought together by a collective will and desire to establish habitable territories beyond the Earth.

The aim of the following essay is to explore the imaginary of this post-planetary culture, with a particular eye to the ways in which its growth has been informed by climate change. Our thesis is that post-planetarism, though it did not start with climate change, is increasingly influenced by it, and thus constitutes a form of climate culture. In the following we draw on both fictional and non-fictional texts. We attend to both the projects and predictions of entrepreneurs and scientists and the work of science fiction writers, with a particular focus on pieces by Gregory Benford, David Brin, and Kim Stanley Robinson.

Climate Change and Post-Planetary Culture

Space voyages, in sicence fiction as well as in philosophy, were most often imagined as essentially circular. Humankind went out into space only to realize that there was nothing to do but to return to Earth. The astronaut Dick Gordon expressed this viewpoint perfectly: the most important discovery of the space missions was the "Earth."[1] Consequently, Bill Anders' *Earthrise* photo was used to illustrate the environmentalist notion of Earth as fragile and beautiful, a thing to be cared for and protected, an island of life in the vastness of space.

This 'discovery' of the Earth from space was more than purely rhetorical, and the history of space conquest and of our awareness of climate change are deeply entangled with this development. Eric Conway's history of climate science at NASA shows how

[1] These are the words of Astronaut Dick Gordon, as relayed by Marina Benjamin in her *Rocket Dreams* (49).

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little we would understand about climate change and Earth systems science if it were not for data from NASA satellites that view the 'whole Earth'. These eyes in the sky have helped scientists track climate change at a global level, and made them see desertification, weather pattern and sea level shifts, even biodiversity loss.[2] Many of the earliest Cassandras of the climate crisis were space scientists. James Hansen (the first scientist to testify on climate before the senate) was a NASA employee. James Lovelock (who, with Lynne Margulis, developed the Gaia hypothesis) came up with this idea while studying comparative planetology.

Yet if the initial decades of space exploration brought us 'back to Earth', towards the end of the 20th century something began to alter the ways in which people were imagining space. People started to dream about heading back out again, *this time for good*. The data that was streaming back from our satellites was terrifying, and the outlooks foretold by predictive models were even worse. The planet was warming at an alarming rate. Land and sea animals were perishing. Human beings would be displaced by climate change, they would find themselves engaged in climate wars, they would have to confront famines and plagues due to their irresponsible abuse of the climate. Clearly the forms of human existence on Earth were going to have to change. The current economic order, with its addiction to "productivism" (Audier) and its fantasies of unlimited growth, was going to have to be reformed. People were going to have to learn to live within limits, they were going to have to break their carbon addiction. Or perhaps not: perhaps humankind could continue on its growth trajectory regardless of the fact that the planet had metabolic limits. All they needed to become a post-planetary species.

Post-planetary solutions seemed possible because the satellite data confirming the anthropogenic causes of climate change was coming from space. It seemed possible because humans had been living on the ISS continuously for decades, and experiments indicated that space agriculture was possible. Space launch costs were also coming down, and the pursuit of extractive industry in space was a near-term project. A solution to climate change might thus be found in becoming a multi-planetary species, or really a post-planetary species. After all, leaving Earth in response to climate change was not aimed at solving the climate problem. The post-planetary project, to quote Elon Musk, was to "die on Mars", to set off into space, and never look back.[3]

Today there exists a growing population of post-planetary dreamers with the means to possibly fulfill their dream. A provisional list would include the "rocket billionaires" Jeff Bezos, Elon Musk, and Peter Diamandis. High-profile scientists and engineers also make the list, including Stephen Hawking, Freeman Dyson, Gerard O'Neill, Carl Sagan and Robert Zubrin. Many science fiction writers and filmmakers are post-planetarists. Larry Niven, Gregory Benford, David Brin, Daniel Suarez and Christopher Noland all have explicitly supported efforts to realize the post-planetary dream. But post-planetary culture is not just an affair of the elites, it is a pop-cultural phenomenon.

[2] On this see Gabrys.
[3] Quoted from Elien Blue Becque.

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Admittedly, not all post-planetarists are concerned about climate change. But an increasing number of them are.

A Dirty Truth

If going to space can easily be justified by curiosity, abandoning the Earth requires more serious reasons, for example, an existential thread. Sir Martin Rees, the English Astronomer Royal and member of the Centre for the Study of Existential Risk at Cambridge University, argues that the current threats confronting humankind include climate change, asteroids and comets striking the Earth, volcanic super-eruptions which would transform the chemistry of the atmosphere, nuclear wars, plagues induced by bio-attacks resultant from either natural or engineered viruses, and malicious AI. Considering these threats, post-planetarists such as Elon Musk believe we stand at a crossroads: either we stay on Earth and "there will be some eventual extinction event," or we "become a space-bearing civilization and a multiplanetary species" (46). Such statements express a wholly reasonable and responsible viewpoint, but it is worth noting that climate change has a quite peculiar status among the threats on Rees' list. Unlike asteroid strikes and volcanic eruptions, climate change is not utterly out of our hands. Yet unlike nuclear holocausts or malignant AI, where the threats lie before us and seem to be in control, the climate change dice have already been cast. We can still respond to climate change, but any response will be difficult. Living sustainably and responsibly is guaranteed to require radical changes in our form of life. Fleeing the planet in response to climate change is radical—but flight will allow humankind to maintain capitalism and its culture of infinite growth. There is clearly something irresponsible and unethical about colonizing space as a response to the degradation of the Earth, particularly when the reason seems expand extractivism into the solar system. It is perhaps for this reason that post-planetarists tend to avoid pointing to climate change as a reason for the "conquest of space". For example, Jeff Bezos, the founder of the rocket company Blue Horizon (and Amazon.com), began a pitch for his project aimed at creating space cities with the insistence that "the Earth is the best planet." He stressed that we need to "work on the here and now" and "get started on the large-scale problems." Yet as listeners soon find out, Bezos' viewpoint is a bit more complicated. Bezos wants humanity to expand out into the cosmos. He claims that if we remain on Earth we will face a future of scarcity and rationing, while if we move out into space the future will be one of economic abundance. He does not address climate change explicitly, yet the specter of climate continually appears between the lines. Bezos claims that his space cities will offer "ideal climates" and "shirt-sleeve environments." He says they will be "Maui on its best day, all year long. No rain, no storm, no earthquakes." His position is, in short, that climates in space cities will be better than the real thing. If we don't save the Earth, we can save the economy and at the same time make these climate utopias a reality. It is difficult to not wonder whether climate change would not be in the interest of Bezos and other investors. After all, the worse the climate on Earth, the more attractive those "ideal" space climates.

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Selling the Stars

One of the keystones of liberal ideology is the idea that self-interest can bring about collective benefit through the "invisible hand." Like latter day Mandevilles, some post-planetarist writers have employed fictional thought experiments to show how a self-interested and market-driven colonization of space can nevertheless ameliorate the harms done by climate change.

Benford's *The Man Who Sold the Stars* exemplifies this perfectly. Like Heinlein's *The Man Who Sold the Moon*, the hero of *The Man Who Sold the Stars* is an entrepreneur, Harold Mann (a composite of Bezos, Musk and Branson, all of whom are mentioned in the tale). The story recounts Mann's efforts to enrich himself through space mining and only treats climate change as a secondary theme, though Benford's future history of the space economy gives a clear account of how he thinks that this will affect the Earth's climate. The beginning of the book evokes our current catastrophe: "Australia was burning again," "an angry black shroud north of Melbourne cloaked the already parched lands" (loc. 2929). Benford speculates that the solution to these issues will come in the form of geo-engineering, using techniques that are spin-offs of space science.[4] He does not disguise that this is working "imperfectly," but he suggests that climate manipulation will allow humankind to head off a repetition of "the terrible drought of the early 2030's." Benford also draws attention to the positive trade-offs associated with climate change, noting that Russia will benefit from "wide open" sea lanes and clement temperatures. Yet where his text becomes most interesting is how he imagines that the conquest of space will improve climate back on Earth. His first "solution" is rather unconvincing: charitable giving. When he hears about the situation in Australia, Mann makes "a corporate donation" to aid them. Benford's next proposal is more convincing: with industry and wealth creation being moved off-world, the colonization of space will lead to a depopulation of the Earth. Excitement will be off-world. With "fewer of us," the climate will be "punched up" (loc. 3473). This is a convincing solution to the extent that many environmental issues, including climate change, are problems of scale. However, there are plenty of people that still live in Europe and on the East Coast of the United States. For Benford's solution to work, most human beings have to want to leave the Earth behind. *The Man Who Sold the Stars* assumes that the abandonment of the Earth will happen for economic reasons. Yet there are other authors that offer stronger reasons why humanity will leave. One of these is David Brin.

The Mother that Consumes Other Mothers' Babies

Ursula Heise has read *Earth* as a planetary novel expressing a global perspective on environmental issues. This is undoubtedly accurate to the extent that *Earth* does explore the negative effects of global warming and other environmental problems. We read, for example, about the "three million citizens of the Republic of Bangladesh" who

[4] Current geo-engineering technologies derive from studies in terraforming carried out in the context of colonizing Mars and creating artificial environments in space stations. On this, see Olson and Oberg.

"watched their farms and villages wash away as early monsoons burst their hand-built levees" (loc. 375). Yet, this perspective suggests that *Earth's* villain, Daisy McClennon, is an environmentalist. Indeed, Brin has very little positive to say about environmentalists or environmentalism. *Earth* mocks those who protest a "pollution-free power plant" because it endangers "former wetlands" (loc. 3079). One of his heroes claims that "only people with full stomachs become environmentalists" (loc. 1346). Daisy is such a misanthrope that she gets angry when her daughter Claire resists being sterilized. The best explanation for Brin's conflicted relationship to environmentalism is the fact that *Earth* is not a planetary, but rather a post-planetary novel.

Earth's happy ending involves the transcendence of the planet. Humankind discovers technologies which allow it to master and control of quantum gravity. This allows humankind become a multiplanetary species capable of lifting entire cities into orbit. Though Brin does not spell this out in detail, one assumes this transcendence resolves the Earth's environmental problems. As one of Brin's heroes, the scientist Stan Goldman observes, humankind on Earth seems to be headed towards "Malthusian calamity" (loc. 9747), a collapse of the sort predicted by Jared Diamond and *The Limits to Growth*. The planetary options presented in *Earth* are hardly desirable. One possible future, and this is the one actively pursued by Daisy, involves a massive reduction of the human population and a return to low-tech. Another possible future, the one worked towards by Goldman and the other heroes of the book, involves using technology and innovation to leverage back the sustainable limits. As a scientist, however, Goldman understands the impossibility of unlimited growth within a finite system. We can extend ourselves for "one decade, then another and another," but we will eventually attain "a genteel decline to a sort of threadbare equilibrium" (loc. 9758). Such a prognosis hardly rings with optimism.

For a post-planetary future to be desirable, one needs to be willing to give up the Earth. To give up the Earth does not necessarily mean sacrificing it or destroying it in exchange for life off planet, though such comportment may well be entailed in any real efforts to leave Earth behind. Joyfully leaving the Earth simply requires believing that the Earth is not the best place for human life. An extreme form of this is a feeling of hatred or disgust towards the Earth. Such hatred of the Earth, or *misterranism*, is evident throughout Brin's novel. Simply put, Brin appears to see Earth as a violent and unpleasant place. Yet given that most of us don't see it that way, Brin apparently feels that he needs to teach us. He accomplishes this task through his depiction of the education of the budding philosopher Nelson.

Nelson is presumably meant to signify the reader, who alongside Nelson learns the way of the world from the Neo-Darwinian biologist and fictional Nobel Prize winner Jen Wolling. At the start of the book, Nelson has an idealized vision of nature. Like many environmentalists, he believes that the biological world is a place of peace and harmony whose balance and goodness is being poisoned by corrupt human beings and their destructive technologies. Then Brin paints a particularly striking scene to liberate Nelson from this delusion. Nelson is caring for a group of baboons. A low-status female comes towards him, trying to use him as a shield to protect her baby against the

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aggressions of higher-ranking females. Nelson does not think much of this, but soon the higher-ranking females and the leading males begin to menace him. Staring down his attackers, Nelson has a moment of reckoning:

> "Now … take it easy, eh? Peace an' love … uh, nature is harmony, right?" They didn't seem particularly interested in reason, nor in slogans borrowed from the Earth Mother movement. They spread to cut him off. I heard they can be pretty mean in their fights between females … I even saw one kill the baby of another. (loc. 1665)

Thinking through what he is seeing, this spectacle of the sheer brutality of existence, Nelson grabs a stick and beats off his attackers. The argument of the exemplum is clear. Earth is not a peace and love world. To survive, we need to learn that it is not some paradise. It is a world in which mothers kill each other's babies. It is a mother that eats other mothers' babies. Most of what seems charitable and kind is essentially an expression of self-interest: "individuals act in ways that promote the success for their descendants" (loc. 3679). "Much of the "generosity" we see in nature is actually quid pro quo—or "you scratch my back and I'll scratch yours" (loc. 3703). "Interdependence," "was usually a matter of eating one other" (loc. 3769). In the cruel functioning of this world, there is little to love. More to the point, our love is wasted on this world. Survival requires finding technological means to unsentimentally master that which challenges our existence.

Yet does our existence not depend upon this Earth? Should we not care about it and love it anyway? Brin's answer to this question is complicated, though ultimately no. As he has Jen Wolling explain, what matters for survival is only the whole:

> And the whole depends upon diversity. The radicals are right about that. Diversity is the key. But it need not be the same diversity as existed before mankind. Indeed, it cannot be the same. We are in a time of changes. Species will pass away and others take their place, as has happened before. An ecosystem frozen in stone can only become a fossil. We must become smart enough to minimize the damage, and then foster a new diversity, one able to endure in a strange new world. (loc. 2382)

The final line says it all. We need to save the whole, but the whole can endure in a strange new world. With the proper adaptations it can endure in space, or in any case in a world that is utterly unlike the Earth that we know and love. Our survival, then, in no way depends upon protecting the Earth, or on conserving things as they were. It demands that we be open to change, that we desire to change, that we unsentimentally accept that the future may lie elsewhere.

Earth is full of evocations of the beauty of this strange new world. This is perhaps most explicit in Brin's attempts to re-signify Anders' *Earthrise*, the iconic image of the blue planet that has historically symbolized planetary environmental consciousness.[5] Consider the following lines, which Brin places in the mouth of a heroine, Theresa:

> As yet, few constellations graced the shuttle's forward windows, and those glittered wanly next to the dazzling Earth, with its white, pinwheel storms and brilliant vistas of brown and blue. Sinuous rivers and fractal, corrugated mountain ranges—even the smokestack trails of freighters crossing sunburned seas—all added up to an ever-changing panorama, as Pleiades rotated out of launch orientation. Of course it was beautiful—only down there could humans live without utter dependence on

[5] On this, see Grevsmühl's extensive history.

> temperamental machinery. Earth was home, the oasis; that went without saying. Still, Teresa found the planet's nearby glare irksome. Here in low orbit, its dayside brilliance covered half the sky, drowning all but the brightest stars. (loc. 538)

Here the image of the whole Earth is described as "irksome," presented as beautiful and boring. Earth is blocking the view, preventing the gaze from seeing elsewhere. The environmental movement has believed that there is 'nothing' to see elsewhere but vast, empty, lifeless space. But the misterran post-planetarist wants us to abandon this love affair with the Earth, this terranocentrism. Later in the book, Theresa again stares out into space and is rewarded by precisely seeing other life worlds: "It gets cold between the stars. Most of space is desert, dry and empty. But there are, here and there, beads that glitter close to steady, gentle suns. And though these beads are born in fire and swim awash in death, they also shimmer with hope, with life" (loc. 11932). Note the plural. There is not only one planet capable of supporting the whole. There is not only one home for life provided we are willing to take up the challenge. We must give up our sentimental and blinded attachment to Earth and to life as it is, wholly embracing the powers of technology and the ability of life to adapt to radical change, to become other than it is, to become alien.

Of course, Brin's "solution" depends on the presence of a *Deus ex Natura*, of a Gaia become real who aids humankind to discover how to transcend the planet. Brin's Gaia, like the Old Testament God, or like Hobbes' Leviathan, is a sublime and wrathful divinity. Gaia is not a god of love, but of terror. At the end of *Earth* humankind learns not to pollute, because shameless polluters are being ripped "to shreds with sudden deadly force." But despite all of this brutality, the recourse to the magical intervention of a big Other allows for humanity to avoid overly dwelling on questions of responsibility and even agency. The inclusion of Gaia, a transparent hand which weighs the dice of destiny, allows Brin to also ignore the relationship between risk and innovation, validating his claim (voiced by Goldman) that the principle of precaution is dangerous because it makes us "too paralyzed to act at all" (loc. 12155). It also means that his characters don't have to think about the trade-offs involved in getting off the planet, for the planet itself takes care of making their choice to transcend the planet for them. Yet perhaps the deepest reason why Brin requires recourse to a creator and divinity is psychological: the recourse to a creator allows for the naturalization of a form of existence that would otherwise be profoundly alienated.

By alienation, here, we mean not only a becoming alien in the sense of leaving the Earth behind, but a being alienated in the sense of losing an essential connection to the entanglements that make the self a self, a human being a human being.[6] Ignoring this point, and judging the flight from Earth from a clinically logical and purely material point of view, there may be nothing wrong with Brin's post-planetary vision of the future. Assuming that we do develop the required technology, if many of us are willing to uproot ourselves from planet Earth (and presumably to give up many of the physical attributes that make us human), our future will doubtless be brighter, at least as

[6] On alienation as rooted in a severing of relations see Jaeggi.

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measured in terms of material abundance, economic growth, and even in terms of the quantity of life in the cosmos.[7] Yet it may turn out that this abundance of life merely actualizes what Parfit has called the "repugnant conclusion": a future in which there is more life, but in which all of these lives are miserable. In this context, we might attend to Giorgio Agamben's distinction between *bios* and *zoe*, between qualified life and mere life, though here the distinction might be phrased as an opposition between earthling lives and alien lives, between modes of existence adequate to humans and those adequate to post-humans. There are reasons to doubt that we can abandon the Earthling within us. Based on significant empirical evidence, the psychologist and philosopher Glenn Albrecht has recently proposed the notion of "solastalgia" to articulate the pain and suffering felt by people whose land has been altered or destroyed by climate change. Would a future humankind not feel pain after leaving a devastated Earth? Would this not be a trauma? Might human culture not live to regret its choice of unlimited egoism in the cosmos over wise restraint on Earth, especially given that the hatred of the Earth may mean that there is no going back due to trade-offs accepted and justified in the name of planetary expansionism?

For the Love of the Earth

Perhaps no one has pushed this line of thought farther than Kim Stanley Robinson. Robinson is an interesting case, since based on the testimony of his early *Mars Trilogy* he is open to the colonization of other planets. What seems to bother him in the current wave of post-plantarism is not the idea of expanding out into space, but rather the motives that are driving this expansion. He is not a misterran and he stands at antipodes to Brin's post-planetarian (and Neo-liberal) idea that all is exchangeable. As Robinson explains in an interview with Asli Kemiksiz and Casper Bruun Jensen: "we co-evolved with Earth and are a planetary expression that needs to fit in with the rest of the biosphere here, […] we have no other choice about that—and this is an important story for science fiction to tell, given there are so many other kinds of science fiction stories saying otherwise" (121). Whatever we might imagine, and however much we might want to believe that we can, should, and will really quit the Earth, Robinson upholds that we are Earthlings.

In the following, we will consider the ways in which his recent writings are speculative anticipations aimed at helping us to adapt our culture to this reality—among other things by responsibly and seriously striving to address climate change—offering us a much more psychologically realistic and powerfully embodied vision of a hopeful future than anything to be found in Brin. The text that best illustrates this line of thought is *Aurora*. This is the story of a generation ship (a long-range space ark of the sort first imagined by Freeman Dyson) full of colonists to the planet Aurora, an Earth-like moon in the Tau Ceti system. The ship is a miniature reproduction of the diversity of Earth, containing twenty-four biomes and a population of around two thousand people. It is a

[7] Jeff Bezos has estimated that the post-planetary population will extend into the "trillions."

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work of high-tech systems engineering integrating insights from latest NASA studies into the production of artificial ecosystems.[8] Despite all of the engineering and research that went into the project, the voyage is not a happy one. The first problems appear upon arrival. While Aurora is Earth-like (which is why the voyage was undertaken), it isn't Earth. Nor is it represented as being better because different from our current Earth (this is quite unlike the representation of Mars and other planets elsewhere in Robinson's oeuvre). The problem with Aurora is that in addition to the elements that seemed capable of supporting human life, the planet hosts a lethal prion-like pathogen: the "Alien." Not unlike Ebola and other zoontic diseases, the Alien is a micro-organism with which humans have not co-evolved. Contracting the alien is purely and simply fatal. The presence of the Alien renders Aurora uninhabitable—not unsuitable for life—but unsuitable for Earthlings…or at least for humans. Confronted with this setback, and with the fact that the Alien seems to be found everywhere on the new planet, the inhabitants of the ship begin to think about what to do next. Some voice viewpoints frequent among post-planetarists such as Elon Musk, claiming that they should terraform other planets in the Tau Ceti system. They hold fast to the belief that anything can be exchanged for anything, that even unpropitious looking worlds can be made Earth-like with a bit of effort: "Surely once life got started on a planet, it would change things fast. Bacteria reproduce very quickly in an empty ecological niche" (loc. 2985). Meanwhile others, drawing more cautionary conclusions from their experience on Aurora, recall that the development of a lifeworld suitable for humans on Earth "took a billion years" (loc. 2985).

As these debates rage, yet another problem comes to light. The artificial biosphere of the ship, just like real attempts to engineer a self-contained ecosystem during the *Biosphere 2* project, is breaking down.[9] This failure reminds us that even with the best current engineering know-how we still cannot fully terraform and render inhabitable even rather limited environmental systems. Ecological "imbalances," or what Robinson, echoing Marx and a whole line of Marx-inspired ecological thinking, calls "metabolic rifts" (loc. 2758), are appearing on the ship.[10] Certain things necessary for life are becoming scarce, while other substances are appearing in excess. More troubling than this imbalance is a phenomenon that Robinson calls "devolution." This is the "interrelated process of disaggregation" (loc. 2764), a separation of all of the parts of the "supraorganism" that ends up putting the ship and all of its inhabitants, from bacteria to human beings, at risk. If the quantity of life is not necessarily diminishing, the quality and forms of life that are enjoyed by the members of the expedition are. Some of the crew members—those with the greatest desire to abandon and replace the Earth—refuse to acknowledge this fact, remaining blithely convinced of the effectiveness of

[8] On the recent research in this domain, see Valerie Olson's *Into the Extreme: U.S. Environmental Systems and Politics Beyond the Earth*.
[9] On this experience, see Mark Nelson's stimulating *Pushing our Limits: Insights from Biosphere 2*.
[10] On this, see the excellent work by John Bellamy Foster, *Marx's Ecology*, as well as Andreas Malm's recent work.

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their geo-engineering prowess both with respect to the ship and with regards to other planets:

> "The ship got us this far," Speller went on. "It's a life-support system of proven robustness. It will last for centuries more, if we take care of it, which means mostly staying out of its way. All we have to do is restock the elements we're running low on. All those elements are common in the Tau Ceti system. So there is no cause for despair. We can still find a new home." (loc. 2807)

Like all good advocates of technological prometheanism, Speller refuses to accept the evidence of his project's failure, remaining committed to the idea that it is possible to technologically strong-arm out of us our Earthly dependencies. He has no fear of risk and no ability to learn from cases where theory—for instance the idea that all diversity is good diversity—doesn't work as anticipated. Against all evidence the advocates of abandoning Earth argue that we can't "know anything except by trying it" (loc. 3036), for in their eyes payoff—ultimately the continual technology-paved expansion of humankind, and above all the market—is worth the risk. In the end, however, and after a tight vote, avoiding the risk of collapse, of "zoo devolution. Co-devolution. Sicken and die and go extinct" (loc. 2991), is reckoned more important than forging onward. The explorers head home to Earth, embracing the narrative telos that dominated before a growing obsession with the inevitability of climate change prompted the latest wave of post-planetary dreaming. Robinson's narrative is clearly calculated to suggest the rightness of their decision. On the way home the carefully engineered onboard systems further break down. The birth weights of children and other animals born during the voyage get lower. But it is not just weights that are going down—so too are cognitive capacities. Various new bacteria are discovered, entities having been stimulated in their growth by the static electricity present in the walls of the ship, some of which are literally consuming the ship itself. To top it all off, on the way home the explorers learn that they were not sent off into space on some urgent mission to save humankind, but only to find new lands and resources for interplanetary economic expansion. Their real goal was to save capitalism and its need for infinite materials and infinite growth—not humankind.

Robinson also explores the meta-discursive foundations and logical fallacies that set current voyages—and irresponsible misterran post-planetary projects—up for failure. In a suggestive phrase that shows him to be a careful reader of ecological accounts of language such as David Abram's, Robinson muses that it is perhaps language itself that is to blame for the miscalculations that led to the disaster, an arrogant forgetting that language is made up of gaps and differences, a stupid overlooking of non-exchangeability of words and things. The likeness between Earth and Aurora was based upon "highly questionable analogies" (loc. 3971), a tendency to see things as alike which are in fact different. Confronted with that which is truly alien, Robinson suggests that science is unable to offer assurances, since its categories simply don't apply. For example, the "alien" that killed the settlers on Aurora is something properly unnamable by science, it is compared to a prion, but it isn't, it is compared to a tardigrade, but it is not that either. The weather in Bezos' Maui-like space cities may be clement, but such

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eternal clemency has nothing to do with the weather on Maui, which is what it is due to the very variability of weather. The point here is not that science is fatally flawed. The point is one that should resonate with students of science studies scholars such as Sandra Harding: scientific words have through time and experience been made to refer meaningfully to Earthly things. They are to a certain degree inseparable from the planetary conditions of their emergence. They can be made to refer as metaphors do to other objects or known objects in alien ecosystems, but in doing this referring they are paleonyms, their reassuring meanings fail to fit in unforeseen ways, they become misleading analogies, sources of error and danger as much as fonts of wisdom and orientation. Only a new language built upon a history of experiences with a place—Robinson has previously speculated that Arabic's gestation in the desert might make it suitable for seeding on Mars—can develop into a scientific language. Any other language, and any other approach to alien science, risks condemning itself to endless alienation, an endless failure to recognize where and when its words fail to articulate the relations among things.

But let us return to the tale. As the ship hurtles back towards Earth with all systems failing, it is no longer a symbol of a failed attempt to colonize a new planet, but rather becomes an analogy for life on Earth, a version of Buckminster Fuller's "spaceship Earth." The people are stuck on the ship, they have no other alternative but to head on home, to make do with what they have. Robinson, through his heroine Freya, recognizes that their only course is "maintenance and repair and recycling," just taking care, because the ship is "the house we live in," the only place where they can survive despite its flaws. When the ship returns to Earth at the end of the voyage, however, the readers and the crew breathe a sigh of relief. For the Earth (thankfully) is not a spaceship after all. It is neither a quickly thrown together nor intrinsically flawed and cramped ecosystem that we need to "maintain and repair and recycle" just to keep alive. Or perhaps we do, but the life that we can live on it simply has no comparison with life in a space ship. The Earth that they return to has its flaws, it is anything but a utopia, and it bears the scars of the tough love that humankind has given to the planet—and of the tough love that the planet has given back to humankind. It is also a terraformed Earth, a repaired Earth, a maintained Earth. Yet Robinson approaches the use of technology, and indeed the entire role of technology within the post-planetary project, in a way that wholly differs from Brin. His technologists do not wish to beat back the Earth as Brin's Nelson does the attacking baboons. Robinson does not confound technology driven change and progress. Robinson has a very specific attitude towards technology. He seeks out technologies that permit us to resonate with the Earth, to amplify it, to harmonize with it, and this is ultimately his view on post-planetary expansion as well: we will become post-planetary when this is the common and concerted expression of ourselves and the Earth.

Yet the way to accomplish this is not via hatred: it is through love. *Aurora* is not a book about transcending the planet, it is about returning to the planet, and understanding what it means to love it. *Aurora*, unlike *Earth*, draws attention to just how special the Earth is, and not just when seen from afar, but particularly when seen up

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close in a lover's embrace. This is brought out perfectly in the novel's closing scene. Freya is depicted engaging in an earthling ritual that for a Southern Californian like Robinson must symbolize communion with nature: she is surfing. Splashed by the waves, washed up upon the sand, Freya feels that she has been reborn, or perhaps that she has merely discovered living for the first time. What is the secret to this alchemy of wind, water, air, and sand that makes the Earth and the surf so magical? One might say that it just *is*, though if pressed I suspect the Robinson himself would talk about the historical co-evolution of humankind with planet Earth. Yet as readers, the real argument is perhaps our own affective experiences. Having surfed, having indulged in some other "focal practice" (in Borgman's sense), some usage of technology that does not alienate us from the life world but brings us into resonance with it by foregrounding our own relatedness to the earthly world, we know what Robinson is talking about. Moreover, we feel that this is indeed a plausible form that any successful geo-engineering or even sustainable development ought to take. When Freya "lets her head down and kisses the sand" (loc. 6752) she shows a love for the Earth that is fully corporal, expressive of an entanglement that binds her very destiny and being to that of the climate and Earthly embodiment. But she also recalls to us a feeling that we know. She is an Earthling, so too have we been. She acknowledges and loves this fact. She and we feel why Earth is not worth exchanging for the logic of exchange.

Conclusions: Progress or Stasis?

Some post-planetarists seem to feel that leaving Earth can provide a solution to climate change, while others, such as Charles Wohlforth and Amanda Hendrix, seem to see space colonization more as an inevitable plan B in the case of climate catastrophe: "But if the climate problem isn't solved, SpaceX is a backup. Getting people off the Earth" (93). Yet the post-planetary solution to climate change is ultimately no solution at all. What post-planetarists really aim to save is not Earth, but most likely the market, which is built upon the idea that what makes human life good is unlimited growth, and which justifies this viewpoint in the claim that all that we desire is capable of being rendered into the logic of the market, and that is to say a logic in which everything can be exchanged for everything else. From this point of view, the latest phase of climate change fueled post-planetarism is even a form of climate skepticism, not because it doubts whether the climate will really change, but because it articulates a doubt as to whether this should really matter to us as human beings. Post-planetary climate culture is thus a kind of hold out. For many of the world's cultures, climate change has already prompted cultural actors to strive towards adaptation, towards the discovery of new and more sustainable ways of living on Earth. Old cultural habits and rituals have been disrupted and are mourned, new cultural tools and modes of *buen vivir* are being developed to alter and reform the techno-social relations and imaginations that link humankind to the Earth. Eco-poets have begun to trace out the deep wounds that we are inflicting upon the planet, novels of climate change and climate catastrophe are attempting both to raise our awareness of the future and to illustrate and exemplify new

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and more vibrant ways of relating to the changing Earth. With every storm and melted ice flow the sense of urgency is redoubled, and climate responsible writers, thinkers, teachers, artists, politicians and other leaders strive to aid us to reform our cultural values, to reconfigure our relationship to technology and to the world in such a way as to perpetuate and ameliorate human dwelling on this beloved planet. The misterrans are not adapting, however. They hew to what they call realism; and they affirm a belief in the now-dated doctrines of infinite economic progress. They think that human nature will not change, that capitalism and the will to growth is rooted in the very marrow of life itself. They hope to make available the space resources that will allow humankind to precisely not change its social system with the coming of climate change.

The alternatives to Earth proposed by some climate change motivated post-planetarists verge on parody. Wohlforth and Hendrix, for example, believe that future human beings will live on the moon Titan, a choice that they justify based on the fact that it is made up almost entirely of hydrocarbons. According to their arguments, this makes Titan perfect because it will provide for all of our needs, providing us with infinite fuel and the resources necessary for making objects in plastic. With every proof of the negative effects of climate change on Earthly life, post-planetarists sink more money into developing rocket technologies to get themselves and their progeny off-planet. This money is invested in a future that should be a past. Post-planetarists may be changing the technologies that link them to the cosmos, but they maintain the ways of relating to the world that have alienated them from the Earth and its processes. Bezos and co. may indeed succeed in becoming aliens, post-Earthly post-humans. They may then be said to have progressed, though in reality they will most likely have ended up doubling down on the most failed aspects of progressive modernity. Flight into space will in no way have addressed the inequalities created by capitalism. It will set up a future in which not only wealth will be divided unequally, but the right to a livable climate, with a happy few dwelling in climate-controlled space stations, and the rest left behind to suffer what Nixon has called slow violence because of their love for an increasingly environmentally ravaged Earth. Even once in space there is no reason to believe that those fleeing from climate change will treat their new worlds as other than as "an excrement of some sky" (219) (to quote WCW's *To Elsie*). Even now this destruction of the cosmos is being prepared, with the first wave of our expansion into space being aimed not at creating habitats, but at establishing extractive zones with unmanned probes.

Though let us not be misunderstood: The dream of expanding into the cosmos and becoming a multi-planetary species is not wrong per se. Perhaps we will have a future on other planets. Perhaps space colonies and a flourishing life on Earth can co-exist. Yet these things will not happen in a way that is desirable for the Earth, or even for our probable future selves, if our primary reason for leaving Earth is to save ourselves from the ravages of a climate catastrophe that we ourselves are creating.

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Works Cited

Abram, David. *The Spell of the Sensuous: Perception and Language in a More-than-Human World*. Vintage, 2012.

Agamben, Giorgio. *Homo Sacer: Sovereign Power and Bare Life*. Stanford University Press, 1998.

Albrecht, Glenn, et al. "Solastalgia: The Distress Caused by Environmental Change." *Australasian Psychiatry*, vol. 15, 2007, pp. S95-S98.

Andrews, James. "In Search of a Red Cosmos: Space Exploration. Public Culture, and Soviet Society". *Societal Impact of Spaceflight*, edited by Steven J. Dick and Roger D. Launius Washington, NASA, 2007, pp. 41-52.

Audier, Serge. *L'âge productiviste; Hégémonie prométhéenne, brèches et alternatives écologiques*. La Découverte, 2019.

Benford, Gregory. "Real Science, Imaginary Worlds." *The Ascent of Wonder: The Evolution of Hard SF*, edited by David G. Hartwell and Kathryn Cramer, Orbit Books, 1994.

---. "The Man Who Sold the Stars." *Starship Century*, edited by James Benford and Gregory Benford, Lucky Bat Books, 2013. Kindle Edition.

Benjamin, Marina. *Rocket Dreams: How the Space Age Shaped Our Vision of a World Beyond*. Simon and Schuster, 2003.

Bellamy Foster. *Marx's Ecology: Materialism and Nature*. Monthly Review Press, 2000.

Bezos, Jeff. "Going to Space to Benefit Earth." Video available at: www.theverge.com/2019/5/11/18564655/blue-origin-jeff-bezos-space-moon-new-glenn

Becque, Elien Blue. "Elon Musk Wants to Die on Mars." *Vanity Fair Hive.* March 10, 2013.

Blumenberg, Hans. *Die Vollzähligkeit der Sterne*. Suhrkamp, 2000.

Borgman, Alfred. *Technology and the Character of Ordinary Life*. University of Chicago Press, 1984.

Brin, David. *Earth*. Hachette Digital, 2013. Kindle Edition.

Chaikin, Andrew. "Live from the Moon: The Societal Impact of Apollo." *Societal Impact of Spaceflight*, vol. 56, 2007.

Conway, Erik M. *Atmospheric Science at NASA: A history*. JHU Press, 2008.

Dyson, Freeman. "Noah's Ark Eggs and Viviparous Plants." *Starship Century*, edited by James Benford and Gregory Benford, Lucky Bat Books, 2013.

Foster, John Bellamy. *Marx's Ecology: Materialism and nature*. NYU Press, 2000.

Fuller, R. Buckminster. *Operating Manual for Spaceship Earth*. Estate of R. Buckminster Fuller, 2008.

Gabrys, Jennifer. *Program Earth: Environmental Sensing Technology and the Making of a Computational Planet*. University of Minnesota Press, 2016.

Grevsmühl, Sebastian Vincent. *La Terre vue d'en haut: l'invention de l'environnement global*. Seuil, 2014.

Hawking, Stephen. "Our Only Chance." *Starship Century*, edited by James Benford and Gregory Benford, Lucky Bat Books, 2013.

 ISSN 2171-9594

Harding, Sandra. *Objectivity and Diversity: Another Logic of Scientific Research*. University of Chicago Press, 2015.

Heinlein, Robert. *The Man Who Sold the Moon.* Gateway, 2014.

Heise, Ursula. *Sense of Place and Sense of Planet: The Imagination of the Global*. Oxford University Press, 2008.

Interstellar, dir. Christopher Nolan. Paramount Pictures, Warner Bros., Legendary Entertainment. USA, 2014.

Jaeggi, Rahel. *Entfremdung: zur Aktualität eines sozialphilosophischen Problems*. Suhrkamp Verlag, 2016.

Kemiksiz, Asli, and Casper Bruun Jensen. "Writing Science Fiction out of Experience: SF, Social Science and Planetary Transformations; An Interview with Kim Stanley Robinson." *NatureCulture,* 2019. www.natcult.net/interviews/writing-science-fiction-out-of-experience-sf-social-science-and-planetary-transformations. Accessed 24 March 2020.

Lovelock, James, and James E. Lovelock. *Gaia: A New Look at Life on Earth*. Oxford Paperbacks, 2000.

Malm, Andreas*. The Progress of this Storm*. Verso, 2017.

Meadows, Donella, Meadows, Dennis, Randers, Jørgen, Behrens, William W.III. *The Limits to Growth*. Universe books, 1972.

Messeri, Lisa. *Placing Outer Space: An Earthly Ethnography of Other Worlds*. Duke University Press, 2016.

Moore, Jason. *Capitalism in the Web of Life*. Verso, 2015.

Musk, Elon. "Making Humans a Multiplanetary Species." *New Space*, Vol. 5, No. 2, 2017, pp. 47-61.

Nelson, Mark, *Pushing Our Limits: Insights from Biosphere 2*. University of Arizona Press, 2018. Kindle Edition.

Nixon, Rob. *Slow Violence and the Environmentalism of the Poor*. Harvard University Press, 2011.

Oberg, Jim. *New Earths: Transforming Other Planets for Humanity*. Stackpole Books, 2017.

Olson, Valerie. *Into the Extreme: U.S. Environmental Systems and Politics Beyond the Earth*. University of Minnesota Press, 2018.

O'Neill, Gerald. *The High Frontier*. Space Studies Institute, 2013.

Parfit, Derek. *On What Matters*. Vol. 1. Oxford University Press, 2011.

Pyle, Rod. *Space 2.0: How Private Spaceflight, a Resurgent NASA, and International Partners are Creating a New Space Age*. BenBella Books, 2019.

Rees, Martin. *On the Future: Prospects for Humanity*. Princeton University Press, 2018. Kindle edition.

Robinson, Kim Stanley. *Aurora*. Orbit, 2015. Kindle Edition.

--- . *The Complete Mars Trilogy: Red, Green, Blue*. Harper Collins, 2015.

---. *Green Earth*. Del Rey, 2015.

Sagan, Carl. *Pale Blue Dot: A Vision of the Human Future in Space*. Random House Digital, 1997.

Schwartz, Peter. *The Art of the Long View: Planning for the Future in an Uncertain World*. Crown Business, 2012.

Scranton, Roy. *Learning to Die in the Anthropocene*. City Lights Books, 2015.

Stevenson, Neil. *Seveneves*. Borough, 2015.

Tabas, Brad. "On Earthlings and Aliens: Space Mining and the Challenge of Post-Planetary Eco-Criticism." Forthcoming in *Resilience: A Journal of the Ecological Humanities*.

Tsiolkovsky, Konstantin. *Dreams of Earth and Sky.* Athena, 2004.

Wallace-Wells, David. *The Uninhabitable Earth*. Random House, 2019.

Williams, William Carlos. *The Collected Poems: Volume I 1909-1939*. New Directions, 1945.

Zubrin, Robert. *The Case for Mars: The Plan to Settle the Red Planet and Why We Must*. Free Press, 2011.

Williams, William Carlos. "To Elsie." *The Collected Poems: Volume I 1909-1939*. New Directions Publishing Corporation, 1945.

Wohlforth, Charles, and Amanda R. Hendrix. *Beyond Earth: Our Path to a New Home in the Planets*. Vintage, 2017.

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