THE WAY HOME: SPACE MIGRATION AND DISORIENTATION

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Abstract: At a time when the viability of planet Earth as a suitable home for the human species is in doubt, outer space is big business. This paper examines the politics of space migration and its effects in perpetuating myths of human exceptionalism. How can we think differently about the ontological determinants that govern our relationship to the planet that we think of as home?

Keywords: Outer space, space migration, design, home, human, posthuman, earth, spaceship, gender, astroculture.

In the twenty-first century, organisations like NASA and Elon Musk's *SpaceX* are committed to the idea of settlement on Mars, with Musk insisting that the survival of what we now think of as the human species depends on us becoming 'multi-planetary'.[1] Both confidently predict that a manned mission will have successfully landed on Mars by 2030. What Brad Tabas calls a 'post-planetary' culture has developed which, driven by threats to life on Earth in general and, he suggests, climate change in particular, is oriented towards off-world migration.[2] For the 'NewSpace'[3] pioneers the goal is to visit other planets for the purposes of eventual colonisation; to boldly go with the express intention of not coming back. So, with George Caffentzis and Silvia Federici, I want to ask: *'Why this urge to get out of Earth? To simultaneously destroy it and transcend it*?'.[4] Or, put another way, if Planet Earth is understood to be 'home' for humans, why are those that consider themselves exemplary humans trying to leave it?

The most straightforward answer, of course, is that Earth, for the billionaires who are currently at the forefront of space exploration, is a failing project; a sinkhole which, if future projections are correct, will consume resources without offering a sufficiently substantial financial return. For Elon Musk, Jeff Bezos and Richard Branson space provides, according to Tabas, 'a lifeboat against the unsustainability of the economy' (*Hatred of the Earth*, p64). At the same time, NewSpace discourse inherits from the history of space exploration a set of myths which provide neat justification for the continued use of scarce resources in the pursuit of new worlds. Perpetuated through popular culture, and science fiction in particular, these myths are part of a more complex structure of ideas which, as I will demonstrate, draw on colonialist interpretations of evolutionary theory and ontological paradigms established at the dawn of modernity to secure space exploration as what might be called a human right. What NewSpace discourse relies upon, in fact, is a tacit acceptance of what it means to be human which, I will propose, is bound up with specific orientations towards Earth as an object that conditions affective and aesthetic relationships to what we call home. I want to explore then the conditions under which space exploration emerges as a viable investment for both corporations and governments seeking to secure an expansion of their assets in outer space, bearing in mind how the idea of home, and the cultural artefacts through which it materialises, affect how bodies are oriented in both Earthspace and beyond.

OVERVIEW EFFECT

Earth as a total entity is an important concept in what Alexander C T Geppert calls 'astroculture', a term that describes the 'heterogenous array of images and artifacts, media and practices that all aim to ascribe meaning to outer space' and that he believes 'found its global apogee in December 1968, with the first photograph of a rising Earth seen from space taken by the astronauts of Apollo 8'.[5] Significant here is the so called 'overview effect', first identified by author and self-described 'space philosopher' Frank White in 1987 which describes a shift in psychological orientation experienced by astronauts when they look down on Earth for the first time and see it as 'fragile and isolated, within an emptiness that is cold and indifferent' (*Space Forces*, p83). Astronauts report feelings of awe, 'a stronger sense of connection to life on the planet, a feeling of protectiveness, and a greater appreciation of the planet's beauty'.[6] Yaden at al., assessing the psychological effects of the overview effect conclude that '[t]he wholeness of the Earth makes it a symbol of almost all that is meaningful in human life … Seeing it from a distance, when one is distanced physically yet connected emotionally, conjures thoughts of home, of the entirety of one's world'.[7] Cosmologist Carl Sagan put it more simply: 'That's here. That's home. That's us.' (*Overview Effect*, p1), and astronaut Dick Gordon confided to Marina Benjamin that what they had really discovered when they went to the Moon was Earth.[8] The overall impression is that astronauts, in their role as high calibre individuals exploring the cosmos as ambassadors for the human race, are uniquely qualified to provide the necessary perspective for how humans should experience their home planet. Their privileged view of Earth in its glorious totality, becomes *our* view through the mediating discourse of aesthetics and the reporting of a quasi-spiritual experience.

As Jordan Bimm has pointed out, in naming and describing the overview effect, White was drawing on established tropes of cosmic awe, connected with expansionist mythologies supported by the ideology of American manifest destiny, but 'rather than America being destined to colonize the West, White argues that humanity is *supposed* to colonise space'.[9] Indeed in a 2007 podcast, White reiterated his belief that '[i]t's a realisation that we are all one in terms of our place in the universe and our destiny … It's a shift in consciousness, a shift in awareness, and identity, and a harbinger of many more evolutionary transformations'. It seems that for White, the overview effect is confirmation, from the universe itself, that the trajectory of evolution, as evidenced by US technological sovereignty, is towards the colonisation of outer space, and he extrapolates from the astronaut testimonies 'a grand teleological narrative about humanity's past, present, future, and inherent purpose in the universe' (*Rethinking the Overview Effect*, p43). Similarly, what Daniel Deudney calls 'habitat space expansionists' are 'largely united in holding some version of [a] cosmic-historical narrative, reading all human history, indeed all the history of life on Earth, as preparatory steps toward expansion off the Earth and throughout the cosmos'.[10]

Perhaps unsurprisingly, NASA and, more recently, the private corporations that are in the forefront of space expansionism, have been happy to adopt White's evolutionary mythology and to employ the overview effect in publicity. Virgin Galactic's 'chief astronaut instructor' Beth Moses believes that 'seeing Earth from space is transformative and will ultimately help humanity and the Earth in unknown ways'[11] and the *SpaceX* website carries a quote from astronaut Sally Ride referring to the 'amazing feeling' and 'totally different perspective' of 'looking back and seeing your planet as a planet'.[12] Jeff Bezos's Blue Origin comes closest to directly articulating White's vision when it announces its commitment to 'building a road to space so our children

can build the future' and explains its feather logo as 'a symbol of the perfection of flight', representing 'freedom, exploration, mobility and progress'.[13] This closely echoes the benefits of pursuing the space race set out in a speech written for US President Eisenhower in 1958 by his Science Advisory Committee: 'exploration, defence, prestige and science' (*Space Forces*, p166) but inflected to suggest escape rather than a consolidation of national power, in the face of competition from what was then the Soviet Union. Nevertheless, for both Eisenhower at the dawn of the space race, intoning his belief that space will bring 'new knowledge … for the benefit of all mankind', and Blue Origin/Bezos assuring us that commercial space flight represents the pursuit of 'a bright future for all of us', the assumption is both that 'all mankind' and 'all of us' is sufficiently inclusive to require no qualification. What this also implies is that 'we', with astronauts in the vanguard, are necessarily committed to something understood as 'progress' which, equally, requires no qualification.

So what is established by the overview effect is the required orientation for inclusion in the glorious future that is promised by space migration. Our 'home' must be experienced as a total object made sense of through totalising ideas, employing an aesthetic that makes use of nostalgia filtered through imperialist discourse. The idea of space migration then is sold as an evolutionary imperative and the overview effect, in concert with the ideology of cosmism, offers assurances that leaving home, for those privileged enough to do so, is merely the next stage in the development of human being.

BOOTSTRAP SPACE CAPITALISM

Broadly speaking, cosmism describes a set of ideas, first proposed by Nikolai Fedorov, an 'obscure librarian-philosopher' living in Russia in the nineteenth century who believed that 'eternal life, universal resurrection, and travel [to] outer space were all an inextricable part' of what he called 'the Common Task' (*Space Forces*, p15, p19). These ideas motivated Konstantin Tsiolkovsky, who Fred Scharmen describes as 'possibly the world's first rocket scientist' (*Space Forces*, p14), who believed that future technology would permit travel to other planets in the solar system but, as Scharmen points out, only so that they could be assessed for their utility in furthering human aims. Tsiolkovsky's programme, as set out in his pamphlet *Panpsychism, or Everything Feels* is 'an undertaking that privileges human experience – its preservation and extension – to the utmost', based on the belief that 'atomic particles' of which everything is composed have a kind of yearning to be part of something greater than themselves and that 'humans are the best thing that any feeling particle could aspire to be part of' (*Space Forces*, p37).

Cosmism is expressed in contemporary astroculture as a belief in human destiny as plotted on an inevitable upward trajectory and inextricable from both colonialism and continual technological development. Sharmen finds its continuing history in the 'logic and rhetoric about the path of civilization' (*Space Forces*, p86), expressed by the Nazis before and during World War Two, and in Werner von Braun's *Mars Project*, a science fiction story which demonstrated the utility of his designs for technology that would facilitate both travel beyond the Earth and settlement on other planets. Later, Gerard O'Neill, whose work became highly influential in the late 1970s and early 1980s proposed visiting other planets in the solar system for the purposes of resource extraction in order to furnish the raw materials for artificial worlds which would support life for

‘thousands and millions of people to live and work in and on’(*Space Forces*, p129). This is a scenario, Scharmen suggests, ‘that many of the private “NewSpace” entrepreneurs follow in the early twenty-first century’; what he later calls ‘bootstrap space capitalism’(*Space Forces*, p130, p211). As Caffentzis and Federici suggest, capital invented the human as a controlled and controllable entity that finds its apogee in the continent and obedient astronaut, both a ‘superman’ and the ideal worker for the space industries of the future (*Mormons in Space*, p63).

Whether or not the overview effect is a real experience that is universally shared among astronauts or whether, as I will go on to suggest, it simply expresses the hegemony of cosmism in articulation with what Donna J Haraway calls ‘the persistence of vision’,[14] what is clear is that it functions to provide an image and an idea ideally suited to support the aims of bootstrap space capitalism. Branson’s space tourism, in particular, relies on the desire of patrons to pay upwards of $450,000[15] for the experience of weightlessness accompanied by the overview effect, and all three NewSpace companies feature videos on their websites which offer tantalising glimpses of the curve of Earth from the windows of an orbiting spacecraft. Although these videos are made expressly for the purposes of publicity, what they help to exemplify is the fact that the overview effect is never unmediated. It is an experience that necessarily requires a technological interface and is thus only made available through complex articulations of bodies and prosthetic devices, beginning with the astronaut enclosed in a spacesuit and extending to the IMAX technologies that bring the experience down to Earth. Furthermore, it is a purely visual experience, conditioned by the technological sublime, which locates the viewing body in a position of unparalleled supremacy. Kornelia Boczkowska suggests that something called ‘the cosmic sublime’ is at work in the proliferating IMAX productions that simulate the overview effect ‘reinforced by special techniques associated with cinematic spectacle and realist aesthetics’.[16]

In the most recent IMAX journey to space, *A Beautiful Planet*, the view of the planet from the windows of the International Space Station provides a backdrop to astronaut daily life and culminates in a visual journey that simulates a full orbit.[17] The views are spectacular in the sense that they offer startling evidence of, for instance, disparities of wealth and poverty and the scarring effects of climate change. While the large cities of the developed West glow exceptionally bright when on the dark side, more impoverished regions are barely lit, while once fertile regions now appear as scars on the landscape. However, without Jennifer Lawrence’s narration and additional material from resident astronauts, it is not always clear what we are seeing. The overwhelming nature of IMAX viewing which, as Boczkowska points out, relies on ‘haptic visuality’ (*Spaceflight*, p133), produces effects at the level of the body at the same time as it mobilises the technological sublime, producing a transcendent experience. The voiceovers function to makes sense of the experience; to assure us that our response is both ‘natural’ and meaningful in the sense that it confirms us as intimately connected with the planet in a way that reaffirms our humanity.

Although the cosmic sublime here is mobilised to raise awareness of global heating and environmental destruction, what we are actually experiencing, in a mediated form, is what Haraway calls ‘the god-trick’ of ‘infinite vision’ (*Situated Knowledges*, p189), locating us in a position of omnipotence relative to both the planet as a whole and the local effects of resource depletion and climate change. Haptic visuality takes us on a journey away from home so that we can experience the nostalgia of looking back through space and time, but without the necessity of

fully engaging with the implications of what we are seeing. At the same time, the IMAX cinema with its plush reclining seats simulates the kind of controlled environment provided by first class air and rail travel. We are astronauts of the next generation, safely delivered from the horrors of a burning Earth, en route to the realisation of human destiny elsewhere in the universe. Google Earth provides for a similar experience. Users are provided with 'a virtual globe which they can manipulate to provide their own personal cinematic rendition of the planet that they can then view and manipulate in decidedly God-like ways'.[18]

This could explain why, at least within NASA, there is resistance to developing solutions which would dispense with the need for manned craft, despite the fact that, following the *Challenger* disaster in 2003, questions were raised about the continued viability of sending people to complete tasks that it was becoming increasingly obvious could be just as efficiently performed by robots.[19] And, as Valerie Olson discovered, in her field work with NASA astronauts, there is equal resistance to retrofitting human bodies for survival in space. 'The idea of "suiting" humans to space', she reports, 'still takes the form of a better removable suit'.[20] Partly this is explained by astronaut resistance to being '"Spam in a can"'(*Into the Extreme*, p87) or 'pre-packed human cannonballs',[21] but this, in itself, is indicative of an investment in the body and, in this case, the labouring body as the sign of the human. More prosaically, US space scientists and engineers have coined the phrase 'No Buck Rogers, No Bucks' (*The End of Astronauts*, p18) as a description of the necessity for their funding applications to emphasise provision for human bodies in space. The inference is that space must be demonstrably 'won' by 'the right stuff', possessors of the 'ineffable quality' marking them out as pioneers of space colonisation, willing to put their lives and their demonstrably superior bodies on the line for, as Tom Wolfe puts it, 'a cause that means something to thousands, to a people, a nation, to humanity, to God'.[22]

Following the moon landing, Richard Nixon gave a speech which spoke of 'the pioneering spirit' of America's past being reinvigorated by the heroes of the *Apollo* programme. 'At that moment,' writes Marina Benjamin, 'the push for colonisation was just one step away' (*Rocket Dreams,* p71). The fact that it required several faltering steps and, eventually, the intervention of multi-billionaires created by the rise of digital capitalism in an era of neoliberal excess, has done nothing to change the justificatory discourse. In fact, it has been considerably strengthened by global heating and the depletion of Earthly resources. Elon Musk, when asked to donate money to the World Food Programme, justified his refusal by claiming that he would prefer to spend the money expediting his plan to colonise Mars; to preserve something that he calls 'the light of consciousness'.[23] Elsewhere he has spoken of building 'a self-sustaining city on Mars and bring[ing] the animals and creatures of Earth there … like a futuristic Noah's ark', but with more than two of each specimen because 'it's a little weird if there's only two'.[24] Jeff Bezos, on the other hand, makes no secret of his ambition to move heavy industry (and the waste that it produces) into orbit 'to be powered 24/7 by solar power, while Earth is rezoned to something resembling a giant nature preserve'.[25] In both these scenarios Earth is constructed as the home we must preserve through the kind of misty-eyed nostalgia promoted by the overview effect, while the discourse of the cosmic sublime simultaneously evokes it as the home we must *leave* to realise our supposed destiny.

IMAGINING THE END OF THE WORLD

Fredric Jameson's observation that 'it is easier to imagine the end of the world than to imagine the end of capitalism' is often quoted as heralding the final triumph of global capital.[26] More appropriate to bootstrap space capitalism is the following sentence in which he speaks of witnessing 'the attempt to imagine capitalism by way of imagining the end of the world'.[27] This was actually written as part of a review of architect Rem Koolhaas's delirious celebration of the impermanence of what he called 'junkspace'[28] and refers to the way in which it captures the instability of consumer capitalism by imaging the demise of the modular architecture, which was its most significant public facing spectacle in the late twentieth-century. Jameson is captivated by the Ballardian drama of Koolhaas's writing and the way in which it evokes the decay of purpose-built space as simply signalling new opportunities for capital to exploit. So, if under conditions of the total depletion of earthly resources and the withering of new markets, as whole populations of worker/consumers are impoverished and displaced, contemporary earth-based digital capitalism has no future, then imagining a future *beyond* the end of the world provides the scenario for capital investment. Increasingly apparent threats to the continuation of life on Earth supply the impetus for a resurgence of pioneering rhetoric which, drawing on the cosmic sublime, offers assurances of deliverance for those who conform to a revised definition of what constitutes the right stuff, a term originally coined to refer to men who embody 'the quintessence of legendary masculinity'.[29]

Under the terms of what De Witt Douglas Kilgore calls 'astrofuturism'[30], the triumph of the US space programme is tacitly understood to be attributable to the success of US culture in nurturing this exemplary astronaut-subject. I will return later to a discussion of the the gender of astronauts, but here it is necessary to point out that what twenty-first century space culture inherits from the idea of the right stuff is that it is the competitive culture of entrepreneurialism, which will produce the deserving few who will escape Earth and colonise the stars. It is not the pilots who are the heroes of the NewSpace race, but the pioneers of late capitalism; men who have exploited the capacities of digital technologies to found new spaces for play, commerce and the performance of competitive individualism. They may not adhere to traditional American values or exemplify the wholesome, clean-living and disciplined type promoted by NASA but their wealth, coupled with the fact that they are already established colonisers of a previously unexplored (digital) space, ensures that they receive a certain amount of tacit support, at least among those who can envision themselves as in the vanguard of space migration. At the same time, references to 'the light of consciousness', 'Noah's ark' and the preservation of a more 'natural' Earth evoke a return, not only to the mythicised origins of the human race but an escape, both from the burning planet and the ambiguities of a global culture in which the right stuff is no longer valued. The message invoked here is of the preservation of something understood as 'human values' through a form of natural selection, in which those who have proved themselves as deserving through capital accumulation are permitted access to a new Eden. These new 'single-combat warriors' (*The Right Stuff*, p125) can imagine themselves as in the vanguard of a new evolutionary 'giant leap' with Musk's Mars Project as the proving ground.

In David Nye's identification of the technological sublime, he points to the fact that the experience requires the emergence of new objects. 'Yesterday's technological wonder is today's banality' he writes.[31] The Apollo programme offered not only a new object for sublime contemplation but deflected attention from the continuing debate about nuclear power, a former shining example of the technological sublime which was now recognised as a threat to life itself.

‘The affirmative sense of achievement that followed the moon landing made government high-tech programs attractive at the very moment when the nuclear stockpile was large enough to destroy every living thing on earth … This final avatar of the technological sublime [was] a literal escape from the threatened life-world’ (*Technological Sublime,* p256

Later, the waning of the US space programme alongside the ratification of the Nuclear Proliferation Treaty paved the way for a new object of the sublime. Originally, I would suggest, this was provided by the idea of cyberspace which, during the late twentieth century was lauded as a new frontier made possible by escalating computer power. In the twenty-first century this has been supplanted somewhat by what Morgan G Ames calls the ‘algorithmic sublime’ in which massive data sets appear to be ‘harbingers of a revolutionary future of which we are forever on the cusp’.[32] As I have suggested elsewhere, these are often presented through an aesthetic which refers to the idea of total knowledge through harnessing the sublime experience of the overview effect.[33] Thus it needs no great leap of the imagination to associate the pioneers of cyberspace with the pioneers of the space race whose powers they seem to have inherited. But the problem with imagining capitalism by way of imagining the end of the world is that ‘[i]f existing economic structures that maximise return on investment are extended into space, capitalism will need someone with desires and needs to exploit’. Scharman’s point here is that, right stuff aside, any mass migration, whether to Mars or elsewhere, must, under the terms of existing economic conditions include workers prepared to build the new world, presumably drawn from a refugee class fleeing the final throes of a dying earth. ‘The figure of the desperate, vulnerable refugee’, he writes, ‘is necessary and realistic in this worldview’ (*Space Forces,* p222).

What is not realistic is the proposition that existing humans would simply book passage on a scheduled flight to a habitable Earth-type planet. The health risks associated with travel beyond the Earth’s atmosphere are multiple and largely intractable. NASA’s Human Research Program, for instance, is currently trying to find solutions to thirty-two identified risks.[34] The solution, according to some advocates for space migration, is biological engineering. Juan Enriquez and Steve Gullans, founders of Excel Venture Management which ‘builds start-ups in synthetic biology, big data, and new genetic technologies’ advocate ‘reengineering the human body’ and ‘tinkering with our genes’.[35] One scenario they imagine is sending a DNA printer to another planet ‘which would serially spit out G, A, T and C chemicals to make long strands of DNA to build designer species before the spacecraft arrives’ (*Evolving Ourselves*, pp257, 259, 261). The point here, of course, is that these kinds of speculation encourage investment by appealing to an ideology which promotes NBIC[37] technologies as heralding the dawn of evolution by design.

Unsurprisingly, it was reported in 2021 that Bezos has made a considerable investment in Altos Labs, whose stated mission is to ‘restore cell health and resilience to reverse disease, injury, and disabilities’ with a view to reversing the effects of ageing.[37] Google’s Larry Page funds Calico, a company also focused on anti-ageing technologies and Elon Musk, despite claiming that he has no interest in living forever, has nevertheless made a considerable investment in Neuralink which is developing technology to link human brains directly to computers.[38] Tech investor Peter Thiel, who was largely responsible for kick-starting Facebook and has been linked to numerous other Silicon Valley successes, has made donations to the non-profit Methuselah Foundation and the SENS Research Foundation which is dedicated to anti-ageing research and made a considerable

investment in the failed genomic sequencing company Halcyon Molecular which had similar aims. He was also, again unsurprisingly, an early investor in Musk's *SpaceX.*[39]

Although none of these companies make explicit links between the technologies that they are developing and space expansion, the potential applications are obvious. Equally, what none of them acknowledge is that the most significant factor in early death is poverty and lack of access to the resources to prolong life through enhanced nutrition and consistent medical services. Bezos has explicitly rejected spending what he calls his 'Amazon winnings' on any programme to address poverty and hunger on planet Earth. In fact, as Scharman points out, Bezos's plan to 'create a situation where millions of people are living and working in space almost *requires* the existence of poverty on Earth, as something that his scheme can both address indirectly, and offer an alternative to' (*Space Forces*, p219). Similarly, Tabas points out that while Bezos insists that 'Earth is the best planet' his enthusiasm for space cities with 'ideal climates' and 'shirt-sleeve environments' suggests that he is less interested in saving the Earth than in saving the economy. 'It is difficult to not wonder', he writes, 'whether climate change would not be in the interest of Bezos and other investors' (*Hatred of the Earth*, p66).

It is worth pointing out here also that extraterrestrial migration is not about to happen or, in fact, may never happen (See *The End of Astronauts*), but the attempt to *make* it happen passes through the development of technologies with extensive destructive potential in the resources that they demand, the potential weapons they give rise to and the waste that they leave behind. A paper assessing the environmental impact of the activities of the European Space Agency, published in 2019 lists space debris from 'old satellites, burned up rockets stages, engines and fuel containers', the 'sustainability challenge' posed by 'the pollution of space by radio frequency' and pollution from 'the exhausts of rocket propulsion'. Further the authors note that 'officially eleven satellites with radioactive Cocomponents have re-entered the Earth's atmosphere and reached the ground since the 1960s', the much lauded reusable launchers, like *SpaceX'*s Falcon 9 are heavier at lift off because of the necessity to store fuel for re-entry and therefore 'the consumption of fuel in the atmosphere is much heavier' creating more emissions than with single use rockets and 'some environmental NGOs … believe that the increase of uranium and plutonium particles in the air is mainly due to the disintegration of satellites'. Notably, they conclude that 'the industry focus [is] on *economic* sustainability, which in a blunt reading is nothing more than having the best product for the most competitive price'.[40] In a scientific report for *Nature,* Aaron C Boley and Michael Byers point to the fact that the huge quantity of space junk in low earth orbit is largely the result of the Outer Space Treaty of 1967 being written in the era of nation state space exploration, leaving considerable wriggle room for mega-corporations, without the constitutional constraints of states, to pollute without discrimination. Furthermore, they note that 'some companies might be less-than-fully transparent about events in LEO'.[41]

HUMAN BY DESIGN

Imagining capitalism by imagining the end of the world thus tacitly promotes an evolutionary scenario in which the designed human inherits the cosmos at the expense of the majority of the world's population. Whether or not becoming post-planetary is a realistic scenario then becomes somewhat beside the point. What astrofuturism essentially promotes is a form of eugenics in which those most fitted to survive, whether on a depleted and burning Earth or elsewhere, are

those that have invested in adapting their physiology to meet the demands of a radically different environment. Indeed, proponents of 'transhumanism', which explicitly advocates directed and technologically enabled evolution in the service of 'improving' what we now consider to be human, either actively promote eugenics or are not averse to admitting that they are committed to a future where the species will diversify. As Alex Thomas has pointed out, transhumanism as a political project, in its most extreme version, relies on a mix of eschatology and market fundamentalism, supported by an implicit faith in a version of the humanist project in which utilising technological development towards becoming a divine being is a theological imperative. [42] Indeed, Charles Wohlforth and Amanda R. Hendrix who advocate human colonisation of Titan, the largest moon of Saturn, use the colonisation of the United States as a blueprint for their projected future while also suggesting that '[w]ith the Holocaust, eugenics got a bad name, but biotechnology is bringing back the hopes it raised without requiring murder or coercion to achieve them' (*Beyond Earth*, p271). While they allow that 'our track record is not good for using technology to mould ourselves', they are confident that '[t]he power of controlling our own evolution will force us to acknowledge our true values' and to ask 'What are good human qualities?' (*Beyond Earth*, p273, p274).

The answer to this question would seem to be provided by the long running US science fiction TV series *Star Trek* which refers to space as the 'final frontier' while promoting a utopian liberal humanist colonisation of the universe. *Star Trek*, despite the conflicts necessary for drama, offers a comforting vision of an evolved humanity where, at least in *The Next Generation*, ships are fitted with family accommodation.[43] Furthermore, as I have argued elsewhere[44], successive series have adhered to the moral and social structures mandated by the military chain of command supported by what Adrienne Rich called 'compulsory heterosexuality'[45], which mandates the patriarchal family as the only social unit suitable to human flourishing. So, in *Star Trek*, despite the introduction of some wildly imagined alien species which have offered myriad opportunities for imagining new social and political formations, what is notable is the way that they are scripted to either conform to a set of values understood as human or are presented as deviant in order to be finally brought under human control. On the one hand, of course, this simply reproduces nineteenth century racial discourse as justification for colonialism, but equally, if as Constance Penley has suggested '*Star Trek* is the theory and NASA the practice'[46], it establishes a milieu for space expansionism in which the material form of the entities that leave home to colonise the stars is unimportant so long as they demonstrably adhere to an ontology and set of values designated as human. As Scharman puts it, 'Those already in power construct their ideal world by promoting more of the same, and calling it human nature … private spaceflight proponents … present their own worldview as dynamic and future forward, when it can be more accurately characterised as an indefinite perpetuation of existing modes' (*Space Forces*, p222, p232). This is equally true of transhumanism which, despite its celebration of a technogenesis divorced from the limitations of the body, is nevertheless deeply invested in the perpetuation of existing modes including the idea of Earth as, again, the 'cradle' of humanity; the home which has nurtured the species to adulthood and which it must now leave behind in order to become fully adult and, it is thus implied, fully human (See *On Progress and Reason*).

As Beatriz Colomina and Mark Wigley have argued, the design of the artefacts which largely structure the conditions for everyday life is not simply a response to the needs of a pre-formed or 'natural' body, but is instrumental in producing the bodies that it serves. Nor is it an innocent

mechanism of what is understood as progress. As they say, '[h]uman designs eventually redesign the human. We are gradually redesigned by our tools.'[47] At the same time '[t]he most radical attempts to reshape the human are typically carried out under [the] guise of reinforcing and protecting the human. Design is a paradoxical gesture that changes the human in order to protect it' (*Are We Human?,* p127). They continue:

> Modern design discourse, in all its countless variations throughout the twentieth century, was all about a new world, a modernity that had to be given shape or whose hidden shape needed to be brought to the surface, including the shape of the 'new human' corresponding to that world, a modern creature living a modern life enhanced by modern tools in modern spaces. Yet the discourse about this newly invented figure never stopped talking about the need to protect fundamental permanent 'human needs', 'human scale', 'human nature', 'human brain', 'human soul', and so on. The new human was repeatedly advertised as a supercharged version of the very oldest human. Modern design was a double movement, connecting the future to the deepest past, as if the species was simply rebooting itself (*Are We Human?,* p128).

The history of modern design, in other words, can be viewed as a vast attempt to finally secure the meaning of the human through the production of artefacts that both promote conformity to an ideal and propel us beyond ourselves in an attempt to gain the kind of perspective that will finally reveal both what we have been and what we will become. As I have argued elsewhere spatial design, in the form of architecture and urban planning, creates spaces that *all* bodies struggle to occupy because a standard of bodily proportions and social relations corresponding to an ideal 'human' type is assumed in their construction.[48] But access to capital provides access also to the elevated view afforded by the heights of the vertical city as well as air and space travel. These are spaces from where an expanded panorama becomes visible, serving to confirm the 'supercharged version' in a superior position in relation to both the ideal type and the supposed 'history' of the human. The history of travel both across and beyond Earth, from the railroad to the spacecraft is an attempt to discover the 'new' human in ever increasing distance from those left behind: colonised others, the non-conforming and the impoverished. Thus, despite the transhuman rhetoric that insists that technologically transcending the body and living forever as informational entities is the only viable future for modern humans, the body as a biological register of movement away from our depleted home and towards a space where the hidden shape of the future could finally be brought to the surface is essential. This is why advocates for space expansion give as much weight to solving the problem of 'how to keep human travellers alive for centuries' as they do to 'how to propel objects to some appreciable fraction of the speed of light' (*Dark Skies*, p218) and potentially why NASA employs someone 'who designs stuff originally dreamed up by *Star Trek*' (*Beyond Earth*, p162). With this in mind, I want to further explore the relationship between astrofuturism and bootstrap space capitalism through an interrogation of spaceship design and the kinds of bodies that it both produces and requires. I want to examine who and what spaceships are *for* in order to understand them as significant objects in the perpetuation of existing modes of what we think of as home in the context of space expansionism.

A PLANET TESTICLE PUSHING A MONSTER PENIS TOWARDS THE STARS

As I have demonstrated, the discourse which constructs planet Earth as home draws heavily on the ideology of cosmism, which itself borrows from American ideas of manifest destiny and the technological sublime. At the same time, concepts of home evoke a space in which the patriarchal family is reproduced and, in the case of space expansionism, this is reinforced by ideas of the astronaut-subject as an exemplary human; a subject position that the NewSpace pioneers are happy to occupy in the service of bootstrap space capitalism. Outer space then is constructed as *masculine* space despite the more recent presence of female astronauts.

My title for this section is taken from a short story by the science fiction writer James Tiptree Jr, who was actually the CIA operative Alice Sheldon, writing under a male pseudonym. 'A Momentary Taste of Being'[49] (1978) is a first contact story in which a group of Earth astronauts (gendered highly masculine) are on a quest to find new planets to colonise but instead are essentially raped by female life-forms who are happy to mate with any passing species and drain them of life. The ship's doctor escapes but he is doomed to spend the rest of his life as nurse to the cosmic zombies that were once his crew. Their fate is foreshadowed in a dream in which his spaceship turns into male genitalia, a playful reference to the design principles on which the majority of launch rockets are modelled.

At the end of the twentieth century, Bryld and Lykke interviewed both US and Soviet space flight officials and found that while in the US, the myth of the right stuff was still pervasive, in the Soviet Union 'they all believe[d] that space flight [was] literally a man's job' (*Cosmodolphins*, p89). Similarly, when Richard Branson first unveiled the ships that would carry Virgin Galactic's space tourists in 2008, they were adorned with images of 'Galactic Girl', based on photos of Branson's mother as a young woman, 'with her eyes closed'. This somewhat revealing imagery (at least in psychoanalytic terms), alongside the fact that the undersides of Virgin craft are adorned with a gigantic all-seeing eye points to the fact that, although Virgin space tourism is all about visual experience, as Kat Deerfield points out, 'their emblematic female astronaut does not possess her own perspective. She is there not to see, but to be seen'.[50] Furthermore, Deerfield points to the way that space discourse assumes heterosexuality, promotes 'the heterosexual family as a model for ideal crew relationships' and consistently blurs the distinction between professional and domestic spaces, a practice which 'disproportionately impacts discussions of women in space'. 'It is often the case,' she continues, 'that when women are introduced to the professional environment of a spacecraft, their presence prompts a shift in the conversation toward 'families' and children' (*Space Culture*, pp91-2).

So, space discourse, with it's continuing emphasis on iterations of the right stuff works to exclude from space flight and thus, in terms of expansionist rhetoric also from the colonisation of outer space, female bodies and others that do not function in conformity with the highly circumscribed internal arrangements of space vehicle design. However, as Bryld and Lykke have argued, for those that adhere to the doctrine of 'panspermia', leaving the women and children behind is positively mandated by a higher power. This idea was first proposed by Swedish chemist Svante Arrhenius at the turn of the 20th century and later elaborated by Francis Crick who, with James Watson, is well known as the original de-coder of DNA. Panspermia proposes that life was seeded in the gravity well of 'mother' Earth by an extra-terrestrial ejaculation and was always already pre-destined to leave the planet once mature and seek its destiny beyond the restraining effects of Earth's gravity; to re-unite with its absent father and to finally come

'home'. In Crick's version, called 'Directed Panspermia', the seeding of the planet was a deliberate project of an as yet unknown extraterrestrial 'higher civilisation inhabiting an alien galaxy very far away' (*Cosmodolphins*, p105). Ridiculous as this sounds, Crick's theory is only a slightly more exaggerated version of views expressed by such luminaries as Arthur C Clarke and Neil Armstrong and the lesser known but no less influential anthropologist and historian Loren Eiseley (*Rocket Dreams*, pp65-7). As Bryld and Lykke point out, 'Crick's views are not very different from either Aristotle's theory of conception where the sperm alone created life in the womb, or from the Christian narrative of creation'. Thus, in this scenario, 'Home and World have exchanged genders: the sacred Home belongs to the Cyber-Godfather, while the World of gravity is left to fallen and feminine Nature' (*Cosmodolphins*, p106-7).

Symbolically then, ships like Bezos's undeniably phallic New Shepard represent the triumph of capital expressed as the right to colonise the universe, in the form of a penetrative metaphor promising a fruitful ejaculation of those that qualify as human into the galaxy where, presumably, they will go forth and multiply (although how is unclear). As Brian Easlea has argued, the penetrative metaphor has been employed since the dawn of scientific modernism to describe the necessary fulfilment of the desire to 'conquer and subdue' a recalcitrant and female gendered nature.[51] In the language of space migration then, every launch beyond the atmosphere proves the fulfilment of this quest and the birth of a new evolutionary beginning, presumably without the messy business of sexual reproduction. All of this is sustained by the notion that evolutionary cosmic destiny mirrors the domestic trajectory of the patriarchal family, in which leaving home is a rite of passage through which sons escape the Oedipal trap and realise their masculinity. It is a model, in fact, which is associated inextricably with private property and the further idea of home as a material possession which expresses ideas of wealth and social hierarchy. As I have pointed out, funding for space exploration depends on provision for human bodies in space. What it also therefore depends on is design which is oriented towards what are understood to be the optimal spatial conditions to regulate human ontology.

OLD SPACE

In the 1960s, Manfred E Clynes and Nathan S Kline designed a 'self-regulating man-machine system'[52] to alleviate the considerable problems of accommodating human physiology in extraterrestrial space by retrofitting astronaut bodies, rather than designing spacecraft to emulate an Earth-type environment. However, in practice, both national space agencies and private companies have largely eschewed this solution in favour of what Jean Baudrillard has referred to as a 'two-room apartment with kitchen and bath launched into orbit'.[53] Studying NASA design cultures in the twenty-first century, Olson found that the idea of 'home' was still a 'persistent ordering concept' with early twentieth-century architectural models providing the determining principles for spacecraft design. Designers that she interviewed all referred to the influence of Le Corbusier on their work, with his idea of homes as 'machines for living'. 'In applying Le Corbusier's thinking,' she writes, 'space architects make "standard" ideas of home theoretically transitory' (*Into The Extreme*, p166). What I take her to mean here is that the adaptability of Le Corbusier's modernist ideas makes them applicable to design projects other than the building of houses. Nevertheless, at the core of his ideas is a standardised idea of what constitutes a human body, that has had a considerable impact on determinations of what counts as human in the first place.

Le Corbusier's template body for building design is a 6'1" male called 'Modular Man'.[54] He is essentially a revised model based on the Roman architect Marcus Vitruvius Pollio's 'Vitruvian Man' made famous by Leonardo da Vinci. Vitruvian Man establishes a set of principles which have governed not only architecture but have also contributed significantly to determining the exclusions which serve to circumscribe the human idea.[55] My own contribution to the debate has been to put Vitruvian Man back into his architectural context in order to examine how built space mandates bodies; how it establishes norms which refer to place as something that bodies and things can be either 'in' or 'out' of. Architecture, I have argued, is fundamentally the something in the past that authorises the future. This is what I call Vitruvian Mantology.[56]

Mantology is an obsolete term that refers to divination and prophecy. In reviving it in this context, I am proposing that we understand designed space as less a container of what is already human and more as the ontological determinant which governs what human can be and, importantly, *will* be. Corbusian design principles applied to space vehicles offers reassurance that the future is safe and can be secured by repetition; that the economic and socio-political patterns that have brought us to this point in time and furnished certain individuals with the means of escape have been somehow pre-ordained. Tellingly, NASA astronauts have an image of Vitruvian Man sewn into their suits and the same image was on the flag planted on the moon in 1969.[57] Thus, Vitruvian Mantology functions to colonise outer space in the name of a constrained and highly masculine idea of what being human means.

In the catalogue for *Hippie Modernism: The Struggle for Utopia*, an exhibition at the Walker Art Centre in Minneapolis in 2015-16, Andrew Blauvelt lists 'the resurgent interest in yoga and spirituality, organic foods, local agriculture and production, recycling and upcycling efforts, net neutrality, open-source computing, climate change, green washing, alternative energy, marijuana legalization, LGBTQ rights, the legislation of women's bodies [and] social protest movements'[58] as significant indicators of the contemporary resurgence of ideas associated with the counterculture of the late 1960s. He omits space migration, although I would argue that it was at the time also a consistent subject of debate and certainly implied, if not directly referenced, in hippie discourse oriented towards utopian futures. Stewart Brand's *Whole Earth Catalog* (1968-1972), an instruction manual for earthly survival, is now lauded as inspiration for such tech luminaries as Apple founder Steve Jobs. As early as 1970, the *Catalog* was announcing 'The Earth crisis is *your* crisis'[59], while at the same time Brand was enthusiastically championing the development of the personal computer. Brand saw no contradiction between the co-operative ethics of environmentalism and the globe-spanning ambitions of what Felicity D Scott calls the 'military-industrial-academic complex' (*Networks*, p103). Thus environmentalism, from its roots in the US counterculture of the 1960s inherits a view of planet Earth as fragile and in need of care but, equally, a vast laboratory for experiments in employing new technologies to usher in the utopia that modernity had always promised. I would argue that, if Blauvelt is correct about the influence of hippie modernism on the eclecticism and historical nostalgia of postmodernism (*Hippie Modernism*, p13), then the specific orientation of hippie ideology towards transcendence and personal fulfilment is equally significant. At the same time, hippies gave enthusiastic support to bootstrap space capitalism in their embrace of O'Neill's space colonies, which seemed to fulfil their demands for what Blauvelt calls 'an alternative tomorrow' (*Hippie Modernism*, p26). The NewSpace pioneers promote similar ideas but now with the added incentive to appropriate off-

planet real estate ahead of the apocalypse driven collapse of property prices on Earth, as well as tapping into the very lucrative markets for space tourism and life extension.

What has become clear then is that there is nothing in NewSpace discourse that is actually *new*. As Marc Augé points out, 'the revolution brought about by the myths of modernity, influenced by Darwinism, favoured recourse to the past in deciphering the present. This only became problematic when, going on from that, it aspired to infer the future'.[60] All the NewSpace pioneers and their associated ventures promise an escalated ride to a modernist nirvana but their orientation is always towards a future that looks either remarkably like an extension of the present or, in some cases, the past. Elon Musk may have read von Braun's *Mars Project* before devising his plans for Mars settlement, but whether he did or not hardly matters. What is relevant is the way that NewSpace discourse provides for an orientation towards the future that allows for a temporal illusion in which the realisation of the destructive effects of post-war consumer capitalism and neoliberal political culture never happened, or at least can be understood as mere preparation for the emergence of the space-faring elite. At the same time, retreat to the comfortable illusions of a time before it was necessary to reckon with climate emergency in any future scenario allows for any political gains of the late twentieth and early twenty-first centuries to be equally elided; as Peter Conlin suggests, 'the twenty-first century is culturally marooned in the twentieth century as if it has yet to begin'.[61] Twenty-first century astrofuturism relies on what might be called tipping-point discourse to promise a techno-determinist utopia in which the colonial dreams of Western modernity are finally realised. Under the terms of Vitruvian Mantology, space migration, and the new configurations of human beings which are really just more of the same, are both fated and inevitable. The point is, of course, that they don't *have* to be.

BREAK-OFF AND DISORIENTATION

One of my arguments here has been that NewSpace discourse is fundamentally masculine in its orientation towards the future, taking for granted either that female bodies will be available for procreation or proposing non-biological futures in which the dream of transcending the body precludes the necessity for accommodating difference. Similarly, as Audra Mitchell and Aadita Chaudhury point out, these dreams are centred in a specifically *white* masculinity which aggressively embodies 'particular histories of settlement, frontier cultures, resource-based imperialisms, genocides of Indigenous communities, histories of slavery, and modes of anti-Blackness'.[62] It thus takes for granted a linear trajectory of 'progress', established in Enlightenment humanism in which the future is written in the language of white imperialism. Leaving aside the possibility of encounters with non-terrestrial life-forms and thus the potential repetition of colonial violence on planets other than Earth, what this means is that non-white peoples, having provided the labour to manufacture the technologies necessary for escape from planet Earth, then become expendable in the name of saving the 'humanity' from which they are excluded. As Mitchell and Choudhury suggest, the threat of destruction is thus displaced onto those who are deemed to lack the 'resilience' to plot their own migration beyond the deteriorating home planet (*Worlding*, p314). Notable here, as Mitchell and Choudhury make clear, is the fact that BIPOC[63] peoples have dealt continually with the threat of extinction which now faces white colonialists and thus have a rich tradition of imagining futures which they characterise as, in general, concerned with 'plural subjectivities and forms of agency', are

‘attuned to nonlineal temporalities’ and ‘embrace lively practices of mobility and hybridity’ (*Worlding*, p321).

‘Science fiction’, Mitchell and Choudhury suggest, ‘regularly influences not only public imaginaries but also public policy, including the development of US military applications and strategy’ (*Worlding*, p319). Writing from within the field of International Relations, it is their contention that taking BIPOC future visions seriously is a necessary strategy for imagining beyond the white, masculine futures that require the end of the world as a prerequisite for colonising another one. Similarly, Rosi Braidotti proposes that while ‘[b]lack and decolonial futurities is what colonial racialised capitalism has stolen and mutilated’, the proliferation of Afrofuturisms in the contemporary conjuncture points to a rich vein of future imaginaries ununcumbered by the desire to reiterate the hegemony of Western imperialism as mandated by Vitruvian Mantology and its expression in the design of extraterrestrial technologies.

A more detailed analysis of Afrofuturism, feminist sf and the future imaginaries produced by LGBTQI+ writers is beyond the scope of this paper and I do not have space here to do them justice. What is important, however, is what Braidotti refers to as the ‘transformative trajectory’ of these fictions in which ‘the technological apparatus that is complicit with the colonial project of Western modernity … is hacked to offer productive and quite subversive alternatives’ (*Posthuman Feminism*, p228-9). While I agree that these fictions are vitally important in centring marginalised peoples in futures debates, what interests me here is the notion of hacking and how it can be applied to describe the way that Afrofuturist and feminist science fictions borrow the discourse of cosmism to subvert imperialist futures. One example is the music and poetry of Herman Blount (1914-93) aka Le Sony’r Ra or Sun Ra. In John Coney’s film *Space is the Place* (1974), written by Ra, he is an emissary from another planet, come to Earth to recruit a black crew to leave Earth and explore the cosmos. As Alex Zamalin writes, ‘Ra’s provocative suggestion was not that black people needed to immigrate or assimilate, but that they needed to undertake space travel in search of new planets’.[63] Ra’s Afrofuturism combined Egyptian mysticism with techno-utopianism to develop a philosophy in which ‘aliens and their technologies function as a line of flight from the slave narrative and the racist present’.[64] What Zamalin refers to as Ra’s ‘utopian individualism’ could not be reduced to ‘any concrete political ideology’ but was nevertheless ‘about transcending an unequal, dehumanising world order that placed profit above humanity and social control over untapped democratic possibility’ (*Black Utopia*, pp108-9). More recently, Ekow Eshun has included Ra’s work in his identification of the ‘Black fantastic’, a cross-disciplinary artform which merges ‘the spiritual, the supernatural and the science fictional’[65] to hack the white progressive assumptions of astrofuturism. Another example is the feminist art collective *Braucht Feminismus?*’[66] who, in March 2022, released a petition to lobby the European Space Agency to adopt their design for a ‘Vulva Spaceship’. Described as ‘surprisingly aerodynamic’, it hacks the design principles of spaceflight technology to critique the phallic orientation of NewSpace discourse and draws attention to the fact that, according to the WBF website[67], only 12 per cent of space travellers have been women.

Similarly, Timothy Morton has suggested that the *Millenium Falcon* in *Star Wars* is, among other things, ‘a vulva – a vulva rushing through the vulva-like realm of hyperspace’.[68] While I would draw the line at Morton’s assertion that the *Falcon* is ‘definitely female’ (why does it need a gender?), I am persuaded by his argument that, in the *Star Wars* universe, it is ‘the ultimate

found object' defying incorporation into systems of ownership and hierarchy (*Spacecraft*, p48, p29). In terms of Object Oriented Ontology it is 'withdrawn' where withdrawal is a property of all objects in that they are, strictly speaking, unknowable in their totality and, in particular, in their temporal aspects or in what might be called their future orientation. When Morton suggests that we have been alienated from the future, rather than, contra fascism, 'a "great" past that we could somehow find underneath the scraps and fragments of the present'(*Spacecraft*, p77), they are expressing the same kind of alienation that is conveyed by the idea of Vitruvian Mantology; a relation to objects in which their use (and thus the way that they use *us*) is predetermined. It is worth pointing out here that for OOO 'object' does not designate only those material objects that take up space in the world. Nevertheless, my concern here is with objects that are built, manufactured and designed because design, as I have suggested, structures orientation and precludes alternatives; or at least attempts to. Designed space, as I have suggested elsewhere, is precarious and prone to hacking if viewed from the perspective of an undecided future (See *Posthuman Urbanism*); 'everything', writes Morton, 'has a secret passage, a hidden corner … The secret quality of things is the future' and, he adds, 'in *Star Wars*, we are not alienated from the possibility that things could be different' (*Spacecraft*, pp74-6).

I want to propose then a way of understanding how things might be different by problematising the specific orientation towards the future which conjures the dismal prospect of a depleted Earth stripped of its remaining resources in the service of a projected migration, that not only might never happen but will necessarily involve sacrifice of the majority in order to 'save' an elite few. As Sara Ahmed has suggested, what we call 'home' is a site of specific orientations in which material objects and other objects in the world like 'thought, feeling, and judgement, or objects in the sense of aims, aspirations, and objectives'[69] are significant in the shaping of bodies and how they act in the world. Proximity is important here, and familiarity, which Ahmed locates as an effect of history. Objects in the home then (and the home itself), are familiar enough to be unnoticed and the force that they exert becomes unremarkable, just as the force of bodies in keeping objects in their place is unremarked. Or, as Ahmed puts it, '[i]f orientations affect what bodies do, then they also affect how spaces take shape around certain bodies' (*Orientations*, p250). Although Ahmed is primarily interested in the relationship between objects and sexual orientation, I find her idea of a 'queer phenomenology' offering us a 'politics of disorientation'[70] useful in providing for a means to think otherwise about the planet that we call home.

Alan Shepard, the first American in space, found the experience underwhelming. When he looked down on planet Earth it just looked small and insignificant, but he nevertheless commented on the beautiful view because the part that he had to play demanded it. He thus inaugurated what Tom Wolfe calls 'the era of pre-created experience' (*Right Stuff*, p256). Although what Wolfe is referring to here is what Jean Baudrillard (1988) would later term the 'hyperreal'[71], we can also read what Shepard experienced as an encounter with disorientation; a moment when he was 'out of place' because the force exerted by the *idea* of Earth as a specific type of object was briefly unavailable. He experienced, perhaps, an aspect of the planet made unavailable by his training but which was nevertheless always *there*. Earth was forced to reappear, rendered strange because he was, for a moment, dissociated from the overview effect. Shepard may have been the first astronaut to lie about his experience but, as Bimm reports, it is a phenomenon recognised by space psychologists. Astronauts are reluctant to be honest about their experiences because they are in fear of being pronounced mentally unstable. In what the

psychologists call ‘the break-off phenomenon’ when they are persuaded to tell the truth, they often report feelings of loneliness, disconnection and ‘frequently reported feeling more connected to outer space or their vehicle than to any sort of pan-human, or total-Earth system’ (*Overview Effect*’, p45).

Astronauts then, have something to teach us. As Morton points out, ‘capitalism is a machine for producing in social space the object as imagined by default Western ontology’[72] and nowhere is this more evident than in the production of planet Earth, and the wider cosmos, as objects which take the shape of the human and, in turn, shape what being human means. We rely on what we think of as human to understand what we think of as our home planet. When we refer to planet Earth as ‘home’, we are expressing an orientation in which its function is given with all that implies for how we make use of it. It is as familiar in this aspect as the domestic furniture that, in Ahmed’s queer phenomenology is forced to reappear, becoming unfamiliar and strange. The astronaut experience of the break-off phenomenon is a similar form of *dis*orientation which can be, says Ahmed, ‘a bodily feeling of losing one’s place, and an effect of the loss of a place’ (*Queer Phenomenology*, p160). To find ourselves again, it may be the case that we need to, in Ahmed’s words, ‘face a different way’ (*Queer Phenomenology*, p124).

As T S Eliot suggested, as long ago as 1942, ‘the end of all our exploring will be to arrive where we started, and know the place for the first time.[73] It may be then, that astronauts really are our guides to the future. Morton suggests that ‘there can be genuine surprise and novelty in the world … a different future is always possible’ (*Humankind*, p102). Personally, however, I would prefer to think in terms of multiple potential futures that may or may not be actualised but are entertained as part of a necessary strategy of ontological awareness. Connected with this, we might want to think of disorientation as a critical practice that we commit to in the full understanding that the world *will* surprise us, leaving open the possibility for different choices for action and different evolutionary trajectories. Then, if the bloated elite of our current historical conjuncture still wish to leave home they can be my guest.

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