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How to Cite: Lubek, T 2019 Cold War 'Astrofuturism' and 'Energy-Angst' in *Destination Moon* and Robert Heinlein's *Farmer in the Sky*. *Open Library of Humanities*, 5(1): 55, pp. 1–31. DOI: <https://doi.org/10.16995/olh.121>

Published: 13 September 2019

Peer Review:

This article has been peer reviewed through the double-blind process of *Open Library of Humanities*, which is a journal published by the Open Library of Humanities.

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POWERING THE FUTURE: ENERGY RESOURCES IN SCIENCE FICTION AND FANTASY

Cold War 'Astrofuturism' and 'Energy-Angst' in *Destination Moon* and Robert Heinlein's *Farmer in the Sky*

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By situating De Witt Douglas Kilgore's understanding of 'astrofuturist' American SF within the context of the postwar 'Great Acceleration' and petromodernity, this article reads astrofuturism's extraterrestrial frontier as an *energy* frontier. Building on Jason Moore's world-ecological understanding of the history of capitalism's recurrent expansions as being dialectically tied to its demand for new sources of energy, the article suggests that a pervasive sense of 'energy-angst' underlies the more obvious tensions mobilising Cold War astrofuturism. This angst, prior to the emergence of 'peak oil' discourse by the mid-1970s, proleptically recognises the finitude of the 'American Century's' petroculture. By imagining the exploration and colonization of extraterrestrial planets upon which crude has never formed, and travel through outer space in which internal combustion engines do not work, astrofuturism is, of necessity, a post-oil imaginary. Tracing the fissures and slippages within and between the optimistic imaginaries of two key texts, *Farmer in the Sky* (1950) and *Destination Moon* (1950), the article argues that astrofuturism's energy frontiers contain as much potential for powered-down imaginaries as the more obvious powered-up visions suggested by high-energy rocket and terraforming technologies. Read in the context of today's precarious petroculture, these texts, in their static perfectionism, invite us to consider how post-oil imaginaries can assist the project of sustainable and equitable energy transition.

'Astrofuturism' and Extraterrestrial Energies

Writing in 2003, De Witt Douglas Kilgore noted that while 'astrofuturism' may have originated in the 'tradition of speculative fiction and science writing' that attended the space race, it continues not only as a dominant mode of American science fiction (SF), but also to inform wider popular conceptions and expectations of the extraterrestrial 'frontier' (2003: 2). More recent years have seen an explosion of critically and commercially successful astrofuturist American SF film and television. Not least among these is the past decade's revival of the *Star Wars* and *Star Trek* franchises, in both filmic and televisual iterations, as well as a host of other blockbusters, such as *Gravity* (Cuarón, 2013), *Interstellar* (Nolan, 2014), and *The Martian* (Scott, 2015). Common to all of these is the speculative positioning of human futures in outer space, even if those futures are not always imagined in triumphant or successful terms. Beyond these speculative fictional universes, in December of 2017, the US President, Donald Trump, issued a Presidential Memorandum calling for 'the return of humans to the Moon for long-term exploration and utilization,' with an ultimate view to Mars, and even beyond (n.pag). While the solidity of this commitment remains to be seen, a number of astrobusinesses *have* for almost two decades been committed to the extraterrestrial frontier, including Blue Origin (founded 2000), SpaceX (founded 2002), and Virgin Galactic (founded 2004). Planetary Resources, founded in 2009 as ARKYD Astronautics, bills itself as 'the asteroid mining company,' and proudly claims in the strapline of its website to be 'Providing Resources to Fuel Industry and Sustain Life in Space' (2017: n.pag). While the heady days of the space race might be over (at least, in its sharply polarized Cold War terms), the astrofuturist tradition remains firmly entrenched in the American cultural imaginary, and animates multi-billion-dollar industries that work to disseminate visions of speculative US-led spacefaring futures, even as they trade stock in the world of speculative finance.

Kilgore writes that in American astrofuturism the extraterrestrial frontier is a reconfigured form of the mythic American West: a 'space of utopian desire' (2003: 2). The imagined emptiness of space, say, allows astrofuturist speculations to rhetorically side-step the American West's blood-soaked history of colonial dispossession and present potential utopian alternatives to the Western mythos, even as, problematically,

they remain complicit with and draw upon that same mythos. As an ultimate 'virgin land', outer space becomes the space 'where we can resolve the domestic and global battles that have paralyzed our progress on earth' (Kilgore 2003: 2). In our own times, one such key battle, global in scale, concerns what recent work in the energy humanities has termed 'an impasse like no other in history' (Petrocultures Research Group 2016: 15). This impasse is rooted in the simultaneous recognition of the unsustainability of capital's energy-hungry, fossil-fuelled logic of accumulation, and our apparent inability to transition beyond it within the necessary time limits of the earth's habitats. For Imre Szeman and Dominic Boyer, as well as a multitude of energy-conscious scholars, 'today's energy and environmental dilemmas are fundamentally problems of ethics, habits, values, institutions, belief, and power' as much as they are technical problems (2014: n.pag.). To help 'work against' both 'the overwhelming media and political promotion of oil as a benign force for good' and 'the weight of quotidian comfort' that oil enables (at least in the core zones of the capitalist world-system far from the frontiers of extraction), Szeman argues that recognising oil as a socially shaping force 'changes how and what we know' (2013: 146–48). In the apparent continued absence of meaningful political and social action towards large-scale energy regime change, he asks: in order to 'explain or explore' oil's political significance, 'might aesthetics succeed where street protests fail?' (2013: 152). In other words, grappling with the oily aesthetics and rhetorical strategies of our various cultural fictions may leave us better equipped to contemplate and enact alternative modes of living in view of oil's inevitable decline. Accordingly, this article responds to Graeme Macdonald's related suggestion that SF is 'the literary mode with the most inherently radical potential to educate and curry debate over an entirely new means of envisioning and imagining our energy futures' (2016: n.pag.). Even if American astrofuturism, as a cultural (speculative) fiction, remains problematically implicated in the mythos of the American West, might we also be able to read for the ways in which cracks and fissures in its optimistic projections undermine the perpetuity of capitalist expansionism and extractivism that it often imagines?

The astrofuturist impulse must be read through, and as a product of, what Stephanie LeMenager describes as 'petromodernity,' that is, an understanding of

modernity which takes into account how our contemporary experience is filtered through 'the cheap energy systems long made possible by petroleum' (2012: 60). Equally, I will read the astrofuturist impulse through Jason Moore's world-ecological conception of capitalism. For Moore, who builds on the work of world-systems analysts Fernand Braudel, Immanuel Wallerstein, and Giovanni Arrighi, capitalism is best understood as a 'world-ecology,' which joins together 'the accumulation of capital, the pursuit of power, and the co-production of nature in dialectical unity' (2015: 3). More simply, capitalism is 'a way of organizing nature,' wherein 'nature's work/energy [is appropriated and] transformed into value' (2015: 2, 13), and whose recurrent accumulation crises and subsequent re-organisational waves of expansion are tied to capitalism's dependency upon ever-more intensively and inventively mobilised sources of this work/energy. I suggest that underlying the Cold War tensions in early astrofuturist narratives is a pervasive sense of 'energy-angst' which continues to animate more recent astrofuturist speculations (Macdonald 2013: 1). This 'angst' simultaneously motivates astrofuturism's expansionism and percolates through its aesthetics and plot devices. The American extraterrestrial frontier emerges in this framework specifically as an *energy* frontier filled with energetic resources, reified in awesome rocketry, gadgetry, and infrastructure.¹ Conquering this frontier is then simultaneously conceived of as a logical outgrowth of the petro-fuelled 'American Century' and an anxiously necessary condition for its continuation. The debates about, and tensions between, America's imagined future role in both powered-up and powered-down visions of capitalist futurity as they emerge in cold war astrofuturism (and persist in more recent astrofuturist counterparts) remain critically relevant to contemporary debates about the futures open to (petro)capitalist modernity, and what must come after it.

Both Irving Pichel's B-movie *Destination Moon* (1950) and Robert Heinlein's Young Adult novel, *Farmer in the Sky* (1950) offer particularly provocative visions of American spacefaring futures which are, nonetheless, undercut by energy tensions

¹ It is important to note at this point that assessments of the literary and filmic energetics of other national astrofuturist imaginaries (in particular, say, the Soviet Union, or, more recently, India and China) would be interesting by way of comparison, yet, for reasons of length, are beyond the scope of this article.

within their narratives. *Destination Moon* is also closely linked to Heinlein; he wrote the source story upon which it is loosely based, *Rocketship Galileo* (1947), and served as co-screenwriter and technical advisor on the film. Indeed, Kilgore argues that Heinlein's work particularly exemplifies trends within early astrofuturist discourse, which argued that in a US-led space future 'the contemporary status quo would find infinite room for expansion' (2003: 78). Heinlein's brand of astrofuturism projected into the future 'an idealized, but fundamentally static view of America at mid-century' as a kind of 'nostalgic perfectionism' (Kilgore 2003: 86, 89). Unlike contemporaneous works such as Frederik Pohl's and C. M. Kornbluth's *The Space Merchants* (1953)—which satirises astrofuturism by depicting an unscrupulous advertising agency's attempts to dupe colonists into settling the barely habitable Venus—both *Destination Moon* and *Farmer in the Sky* present optimistic and sincere visions of US-led futures in space, wherein capital can transcend earthly ecological and political limits and America can and *must* retain its global hegemony through frontier mythology writ large amongst the stars.

Destination Moon imagines the first manned exploratory mission to the moon, financed and supported by the industrial infrastructure of American private enterprise. The film positions the moon as a strategically important military site, a potentially investable uranium frontier, and, finally, a playground for expansionist and extractivist ambitions. *Farmer in the Sky*, meanwhile, follows the teenager Bill Lermer, and his family's decision to help settle a newly established colony on the Jovian moon Ganymede, in view of food scarcity on an overpopulated Earth. As with *Destination Moon*, various characters in the novel view Ganymede as an investable prospect; a source of cheap caloric energy; a way to preserve humanity against possible nuclear apocalypse; and, crucially, in the mould of the mythic American West, an exciting, wild, and dangerous space offering challenge, adventure and potential fortune to those willing to try their luck. Even within these apparently static presentations of "business as usual," however, we can elicit multiple deflationary gestures and fissures in the optimistic speculations of these texts. If, for Macdonald, SF's 'contemporary cognition is as energy-conscious challenge' (2013: 14), these gestures and fissures demonstrate that, well in advance of the United

States' diminishing oil production and emergent 'Green' discourses in the 1970s, a pervasive sense of energy-angst animates *Destination Moon* and *Farmer in the Sky*. Macdonald notes that 'to imagine a world where oil use "doesn't matter," is to live literally in another world' (2013: 17). Even if *Destination Moon* and *Farmer in the Sky* seek to project the kind of nostalgic perfectionism that Kilgore identifies into the future, the energetic tensions embedded within them destabilise their narratives of upward and outward American progress-as-expansionism. This suggests that the move off-world is not quite, as the novel and film would have it, the simple or inevitable prospect that it might have initially seemed in the 1950s. Equally, in the context of today's precarious petroculture, this destabilization points toward a condition of possibility that invites us to consider the ways in which these texts from the era of the Great Acceleration imagine living in de-oiled worlds, and how they might inform the contemporary debate on energy transition.

The 'Red Threat' and Energy-Angst: *Destination Moon*

Astrofuturism is rooted in the context of what Will Steffen, Paul J. Crutzen and John R. McNeill and others have since characterised as the 'Great Acceleration' in human activity: exponential upward trends in, among other things, population growth, economic growth, oil consumption, power usage, and carbon emissions from the immediate postwar period to the present day, contributing to the inevitable necessity for energy transition (2007: 614). This Great Acceleration—which although globally impactful is also geoculturally uneven—refers not just to the physical facts of humanity's increasing metabolising of earth's resources, but also to a structure of feeling: the felt experience of life itself becoming ever-faster, attended by increasing and intensifying compressions of time and space. In astrofuturist aesthetics and rhetoric we see such logics of higher, further, and faster. These energy-hungry visions of futurity appear as logical extensions of a condition Timothy Mitchell identifies as originating in oil's ability to provide 'abundant and low-cost energy' (2011: 139). In the postwar period, oil's relatively low and stable price suggested that 'although increasing quantities of energy were consumed, the cost of energy did not appear to represent a limit to economic growth'; it could be 'treated as inexhaustible' (2011:

139–40). Hence, through the specific mobilisation of the inherent assumptions of this 'petroknowledge,' Mitchell argues that a certain form of 'carbon-democratic' politics developed, oriented toward an understanding of the future as 'a limitless horizon of growth' (2011: 139, 142). As an outgrowth of this petroknowledge, the astrofuturism of the 1950s and 60s could likewise present the space frontier as a limitless horizon, at least before the felt experience of the 1973 oil crisis would set the tone for an entirely different set of speculative visions which would dramatize the energy-angst foregrounded both by oil price hikes and emergent Green discourses which codified oil as dirty, toxic, and finite.

However, the 'energy unconscious' (Yaeger, 2011: 309) of *Destination Moon* and *Farmer in the Sky* also manifests a particular kind of energy-angst, motivated by the Cold War's ostensible 'Red Threat' to commonsense notions of the 'American way of life', which had been distinctly nurtured in the 1950s by taken-for-granted access to cheap energy, especially petroleum. Matthew Huber has argued that by the early 1950s, 'a specifically *privatised* mode of spatial mobility' had become *de rigueur*, through the mass dissemination of cheap engine power, such that petroleum 'was constructed as the unquestioned lifeblood' of this new American lifestyle (2013: 18, 47; emphasis in original). For Huber, the atomised, privatised suburban home, and the new suburban frontier of mid-twentieth-century American petromodernity constituted a kind of analogue for homesteads from the frontiering past (2013: 39, 42). Similarly, astrofuturism promised to re-open the frontier that had famously been declared closed by Frederick Jackson Turner at the end of the previous century (1920: 1). Like the allure of the open road, the extraterrestrial frontier appears perpetually open; as limitless as the universe is limitless, even as simultaneously it exists only as an imaginative, promissory possibility. And, like the private suburban home, a notionally safe and autonomous outpost in the 'wilderness' of mid-20th-century American petroculture, the astrofrontier offered the fantasy of a space where citizens could freely and radically exercise this personal autonomy. As Cold War anxieties hardened, and a new 'hot' conflict erupted in Korea, this kind of private, petro-fuelled autonomy and the astrofuturist promise of a forever-open frontier appeared

increasingly jeopardised. The confluence of these particular anxieties animates the astrofuturist impulse of *Destination Moon*, in that it seeks to re-affirm the contemporary form of petroknowledge that had privileged the mythic west as the definitive source of 'the raw fuel for a nation of energy junkies' to keep America 'on the move' (Athearn 1986, 210). The film's energy-angst thus relates not to depletion or rising production costs as such (even if its expansionist imaginary implicitly registers these), but rather a perceived threat to the particularly oil-saturated mode of living enabled in 1950s America by cheap energy, which could, at least for the time being, still be taken for granted.

Destination Moon is set at some unspecified point in the 1950s—the present day or near-future of contemporaneous cinemagoers—and as such presents a spacefaring Soviet Union as an immediate and threatening prospect. The film announced to its audience that translunar rocket flights were merely years away (in reality, less than twenty under the Apollo Programme), and anticipates the national unease that would eventually ensue when, just seven years after the film's release, the USSR successfully launched *Sputnik*. In the film, General Thayer effectively fires the starter pistol on the space race by announcing that 'the race is on, and we'd better win it because there is absolutely no way to stop an attack from outer space.' Likewise, Jim Barnes adds that 'if we fail, we'll take a colossal beating, so we can't fail,' betraying an all-or-nothing mentality that at once acknowledges and denies the possibility of failure. Bradley Schauer describes *Destination Moon* as the film 'that initiated the science-fiction boom of the 1950s' and, in a not uncommon reading, emphasises its makers' commitment to a 'thoroughly realistic film about space travel' whose plot 'obstacles' are 'purely technological' (2015: 2, 11). For A. Bowdoin Van Riper, the film appears as a de-politicised 'space procedural,' in which the technical problems and execution of space travel drive the plot (2001: 45). He describes the film's closest thing to a political statement as being 'a vague reference to the need to reach the moon before other, unspecified foreign powers' (2001: 45). However, *Destination Moon's* technologically-grounded astrofuturist gestures are undergirded by a both an energetic and political angst.

A 1950s audience would have known precisely who these 'unspecified foreign powers' were, for example. General Thayer's warning is followed by a dramatic music cue and slow pan across a roomful of sombre-faced investors, effectively arresting the film's narrative momentum to allow its audience to fully absorb the statement. Thayer argues that failure means the United States will cease to exist, replaced by the 'dis-united world.' Before supply and pollution anxieties came to the fore in the 1970s, then, the film's acknowledgement of the strategic importance of the space frontier hinges upon the argument that powering the future depends upon the maintenance of both the physical and affective infrastructures of present global (petro) energy regimes, as then-filtered through US hegemony and vulnerable to nuclear attack. The film is therefore an appeal and a warning, both to the public and the policy-makers: fail to invest in space, and leave the door open to a 'Red' universe.

The High-Energy Technical Sublime

If the Iron Curtain presented a barrier preventing American cultural and economic dominance from encompassing the entire globe, the possibility of moving upwards and outwards into space suggested an alternate route to domination. It is important to note that when *Destination Moon's* rocket designer, Dr. Cargraves, steps onto the lunar surface it is '*in the name of the United States of America*' that he claims the moon, 'on behalf of, and for the benefit of, all mankind' (my emphases). This expansive gesture is circumscribed, however, by the fact that *Destination Moon* is primarily a film that deals with extraterrestrial exploration, rather than the colonization and appropriation of space as a resource frontier. Instead, the energetic frontiers of the film's astrofuturist narrative are codified in the rocketship itself. If the Cold War was being fought on the frontiers of what Gregory McLauchlan and Gregory Hooks describe as the 1950s unity between 'cutting edge Cold War science and technology [...] and national prestige' (1995: 761), what again needs emphasising is the contemporaneous cheap petrolic energy regime that allowed science and technology to be mobilised in these physical and affective ways. Cheap oil fuelled a cultural imaginary 'wherein highways, electricity, and automobiles, were equated with progress and the technological sublime' (Huber, 2013: 47). Accordingly, *Destination*

Moon deploys what we might call an aesthetic of the high-energy technical sublime, which 'celebrate[s] technology as progressive and the American future as expansive in awesome and poetic displays of graceful, glittering new machinery' (Sobchack, 2005: 263–264). Long and mid shots of the rocket, swarming with busy, ant-like workers, emphasise the technical feat facilitated by the might of American industry (see **Figure 1**). The high-powered image of the rocket resonates with Anna Tsing's description of the postwar period as being when the American origin myth was relocated in a conceptually endless 'technofrontier [...] made possible by industrial technology' (2005: 58). Similarly, the ship carrying colonists to Ganymede in *Farmer in the Sky* exemplifies the thrust of technological progress. Eight years later, Hannah Arendt would write that 'distance has yielded before the onslaught of speed' (1958: 250). New technologies underpinned by fossil-fuelled energy had the capacity to drastically reduce travel times and thus intensify flows of capital, labour and energy between core and periphery, fuelling the accelerating expansion as more and more extractive frontiers came within reach.



Figure 1: The rocket ship under construction. Author's screenshot. *Destination Moon* (1950) Directed by Irving Pichel. USA: Eagle-Lion Classics. [DVD] (2009) MPIC Video.

Notably, in *Farmer in the Sky*, Bill Lermer conceptualises the distance between Earth and Ganymede in terms of *time* rather than space. The star ship, *Mayflower*, is superimposed on its historic precursor:

[...] distance doesn't mean anything; what matters is how long it takes. [...] It took the Pilgrims sixty-three days to cross the Atlantic [...] but [...] the *Mayflower* – this *Mayflower* – will reach Ganymede in sixty days. That makes Ganymede closer than London was to Plymouth Rock. (Heinlein, 1967: 12)

Reflecting Tsing's conviction that the 'technofrontier is always open and expanding' (2005: 58), *Farmer in the Sky* imagines a limitless potential for bigger, faster, and 'better' spaceships.² Bill is told that previous emigrants to Ganymede have had to spend years in space, but that eventually his 'grandchildren will make the trip in a week' (Heinlein, 1967: 53). Moreover, these lanes will become so busy that eventually 'traffic cops' will be needed to keep the traffic flowing (Heinlein, 1967: 53). The gesture reconfigures these interplanetary shipping lanes as interplanetary highways, mapping contemporaneous petromodern ideas of mobility onto the astrofrontier and offering prophetic glimpses of the intensification of globalization in the latter decades of the twentieth century. As with the filmic presentation of the rocket in *Destination Moon*, the space vessels in *Farmer in the Sky*, are technologically sublime codifications of 1950s petroknowledge, even if they are not directly fuelled by petrol, but by atomic reactions. The shuttles that carry colonists from Earth to the *Mayflower*

² It is also worth noting here the importance of today's 'digital' revolution, which, of course, brings with it different notions of time and space than those which we see in *Destination Moon* and *Farmer in the Sky*, and is something quite different from the notion of technological progress as embodied in their displays of heavy machinery (see, for example, Zygmunt Bauman's extensive writings on 'light' and 'liquid' versus 'heavy' and 'solid' modernity, including *Liquid Modernity* [2000]). The importance of digital technology in more recent astrofuturist narratives and the particular energy questions engendered by this—or, indeed, the energy questions raised by the confluence of 'light' and 'heavy' technology as exemplified in, say, gargantuan starships that are wholly or in part 'run' by sophisticated artificial intelligences—would, again, make for an interesting point of comparison, but is beyond the scope of this article.

are named *Daedalus*, *Icarus*, and *Bifrost*, in obvious mythological allusions. The novel figures the launch of the *Daedalus* in vividly energetic terms:

She had fine lines and was a mighty pretty sight, gleaming in the morning sunshine. [...].

She canted slowly over to the south, just a few degrees.

Fire burst out of her base, orange, and then blinding white. It splashed down into the ground baffles and curled back up through the ground vents.

She lifted.

She hung there for a breath and you could see the hills shimmer through her jet. And she was gone. (Heinlein, 1967: 31)

Like *Destination Moon's* rocket, the *Daedalus* gleams impressively on the launch pad, here in the dawning light of America's extraterrestrial future. Numerous active verbs describing different kinds of motion—'burst,' 'splashed,' 'curled,' and 'lifted'—configure the rocket's motion in forceful, exuberant, upwardly-mobile terms. Within this short passage there is an interplay between notions of rest and motion, which builds anticipation towards the moment of the vessel's launch: it begins at rest, slowly cants into the launch position, seems to hover for the briefest of instances before disappearing into the sky. This further emphasised by the split into brief paragraphs and the inclusion of short sentences—'She lifted.' 'And she was gone.'—which increase the narrative pace and dramatic energy of the scene. Likewise, the *Mayflower* erupts into the narrative, being described as 'suddenly enormous', figured in awesome terms with 'little flies on her' that are actually men in spacesuits (Heinlein, 1967: 41), paralleling numerous shots of *Destination Moon's* rocket. If, as Michel Foucault has suggested, the seafaring ship has been 'the great institute of economic development' and 'simultaneously the greatest reserve of the imagination' (1984: 9), descriptions such as these emphasise how the rocket or space ship takes on a similar role in 1950s astrofuturism.

Indeed, the rocket is *Destination Moon's* main attraction, transcending the thin characterisation and low star-quality of the cast of astronauts. It featured prominently in the film's marketing material as the vital technology carrying American civilization

to the stars. Indeed, as Schauer notes, it was precisely the 'lack of star actors' that freed up the money for expensive and spectacular visual effects and set-design, which were crucial to the film's deployment of the high-energy technical sublime (2015: 10). These included an impressive '150-foot-tall model of the rocket ship's tail' for location shooting (see **Figure 1**), an elaborate lighting rig to simulate stars, and a system of gimbals to aid the illusion of weightlessness in the rocket interior scenes (2015: 10). These savings also enabled the use of Technicolor, 'an indulgence utterly alien to the B film' (Schauer, 2015: 10). In addition to the quality of the special effects, which hold up remarkably well after almost seventy years, Technicolor significantly enhances the film's spectacularization of the technical sublime. Even if the rocket itself and the lunar landscape appear monochromatically drab, the astronauts have brightly coloured spacesuits. While this was no doubt a creative choice to make the most of the Technicolor format, the colours also dramatically foreground the astronauts as a human presence in space in panoramic exterior lunar shots. A technophilic montage of the rocket's construction dominated by images of metal casting, banks of computers, and earnest telephone conversations fosters the impression of rapid progress, emphasised by the vibrancy of colour on display. At the same time, dramatic music and the restless pacing and energy of the montage aggrandises and emphasises the awesome power of the combined forces of American industry and high-technology.

And yet, even in the particular moment of postwar accelerationism and 1950s energetic excess, *Destination Moon* also evinces a strain of energy anxiety. It may be underplayed, but is a detectable presence nevertheless. Jim Barnes warns his fellow investors that they must all commit themselves to the rocket project 'if we want to stay in business.' As with his later emphatic statement that failure is not an option, this assertion undercuts the film's staging of the rocket as a logical outgrowth of the petro-fuelled expenditures of the 'American Century' with an anxious counter-sense of new kinds of atomic energetic excess, represented by the rocket, as essential to the future of accumulation. Prefiguring petro-depletion anxiety, this gesture suggests that, at least as far as Barnes's pitch would have it, atomic energy and the extraterrestrial expansion it enables can and must support accumulation in ways

that petroleum apparently cannot. Indeed, *Destination Moon* sets up an unresolved tension throughout between petrolic and atomic energies and mobilities in the energy mix it presents. A particular shot sees a group of engineers working on a scale model of the atom-powered rocket, which is positioned centre-frame while semi-complete, skeletal petro-powered aeroplanes are pushed to the background in favour of the new project (**Figure 2**). Later, in a cartoon segment which forms part of the pitch to in-film investors and is equally an explication of rocket technology to a lay cinema-going audience, Woody the Woodpecker, clearly embedded within a petrolic mode of mobility, derides the rocket. He says that it will 'never work' because it lacks the propellers of conventional airliners. After the narrator of the segment explains the easily traversable distance between earth and moon, Woody responds sardonically: 'sure, with a paved highway, and a gas station at every intersection!' The narrator's explanation overcomes these objections, and positions translunar rocketry as a simple prospect. Contrasted with the obvious dirtiness of crude, the rocket offers a graceful, shiny, clean-looking alternative that is in some sense a qualitative and



Figure 2: The new atomic rocket is notably foregrounded and emphasised. Author's screenshot. *Destination Moon* (1950) Directed by Irving Pichel. USA: Eagle-Lion Classics. [DVD] (2009) MPIC Video.

quantitative improvement. The dream of endless intensive energy production and endless expansive mobility initially created and supported by petroleum is here viewed as being ever-smoother in the film's speculative atomic future.

In one sense, then, it seems that regardless of the energy source, petrolic or atomic, the film taps into a deeper sense of *energy* itself as being the key means to secure accumulation and the reproduction of US high-energy modes of living, with the atom poised as a new, exciting, and emergent fuel source. Woody's sarcastic interjection, however, like Barnes's prophetic warnings to his fellow investors, undercuts and deflates the ease with which the film imagines this transition will proceed. Just as the abandoned airliners remain as concrete presences dwarfing the rocket model, Woody's inability to conceive the translunar journey without deploying the imagery of the highway and the petrol-pump sets up a clash between petrolic and atomic modes of living, and of mobility. As it sits on the launchpad, the atomic rocket appears as the culmination of American petroknowledge, even as, of necessity, it must also gesture towards a post-oil imaginary. The forms of petroknowledge that privileged automobiles as sites of privatised mobility and individuated power collapse under the weight of challenges posed by space travel. Woody's 'highway' and 'gas station' understanding of cosmic mobility—which, to borrow from Yaeger, we might summarise as the hop-in-your-car-and-drive-anywhere 'magic' of the open road (2011: 309)—gives way to the circumscribed collective endeavour represented by a rocket that must be piloted by a crew of four astronauts and supported by a legion of ground crew who assemble it, fuel it, and monitor its progress. The film's end-titles announce confidently that 'this is the end of the beginning,' but we are left to ponder precisely what is ending here, and what is beginning. With the exception of the cartoon segment, the film does not explicitly compare the relative merits of rockets versus highways and automobiles as vehicles for the high-energy technological sublime. Instead this concern is buried in its energy unconscious, and the film remains ambivalent as to what its imagined dawning rocket age might mean for particular forms of petroknowledge rooted in the automobile. For Szeman, much science fiction is invested in projecting into the future the 'bad faith of the present' that 'we can continue to be who we are now'

under different energy systems (2011: 325). *Destination Moon's* surface-presentation of the high-energy technological sublime, couched in astrofrontierism, is certainly complicit in this. However, the anxiety expressed through its unresolved tension between the possibilities and distinct social dynamics of petrolic and atomic regimes of transport circumscribes this very assumption, even if the film ultimately remains silent on the extent to which both might coexist in the future.

Equally importantly, although the film seems invested in presenting the rocket and extraterrestrial expansion as exciting and heroic (the anxious impulses behind that excitement and heroism notwithstanding), we can read these same expansive gestures via energy- and ecological-angst as being deflated, or at least disrupted, by a sense of threat. John R. McNeill and Corinna R. Unger have suggested that, over the course of the Cold War, 'fears of radiation poisoning and nuclear-winter scenarios helped tilt popular culture in the direction of ecological thinking' (2010: 11). The rocket is also inscribed as a potent symbol of danger and violence. Significantly, among the first things we see in the film is what appears to be recycled test footage of a German V-2 rocket (**Figure 3**). Implicitly, the film equates this object of mass



Figure 3: Apparent recycled test footage of a V-2 rocket. Author's screenshot. *Destination Moon* (1950) Directed by Irving Pichel. USA: Eagle-Lion Classics. [DVD] (2009) MPIC Video.

destruction with the technologically sublime object we see later. In a visual rhyme, both point skywards and are surrounded by an empty expanse of sky, the surrounding space vulnerable to penetration by this sharp and energetic object. The government refuses to allow a test of the rocket's engine because of the public fear of radioactive fallout should engine failure occur. Crewmember Joe Sweeney anxiously asks Barnes and Thayer 'you don't think it could blow up?' when they try to persuade him to join the mission, and, during the take-off scene, the craft threatens to shake itself apart while an uncomfortably high-pitched whine assaults the audience. The astronauts are strapped down, pinioned by G-forces that contort their faces into grotesque shapes (**Figure 4**), in contradistinction to the smooth journey imagined by the film's cartoon segment. However, these gestures towards the destructive flipside of atomic energetic excess remain characteristically brief, in keeping with the film's overall recuperation of the atom's notionally peaceful potential. Barnes et al. disregard the government and blast off anyway to no ill effect. Sweeney's doubts about the rocket's safety prove unfounded, while the discomfort of the launch scene soon passes and



Figure 4: Astronaut Joe Sweeney is pinioned by G-Forces and in clear discomfort during take-off. Author's screenshot. *Destination Moon* (1950) Directed by Irving Pichel. USA: Eagle-Lion Classics. [DVD] (2009) MPIC Video.

gives way to the excitement of zero-g and its spectacularization through novel visual effects. Nevertheless, the threat of catastrophic, uncontrolled energetic excess remains built into the film's astrofrontierist future-imaginary.

Astrofrontierism and the Capitalist World-Ecology: Re-Designing the 'Web of Life' on New Worlds

By understanding *Destination Moon's* 'contemporary cognition' as an 'energy-conscious challenge' (Macdonald 2013: 14), the exploratory foray that it depicts can be read in terms of an awareness of a necessary replacement for oil *elsewhere*, precisely because of the tensions within the film discussed above. Just as the US transitioned from being a net producer to a net importer of oil around mid-century—consonant with the uptick in petroleum use to sustain petromodern American lifestyles—the moon appears as a cipher for the earthly extraterritorial resource spaces and quasi-imperial extractivism that these lifestyles demanded to sustain them. Within Jason Moore's world-ecological conception of capitalism, capitalism's recurrent historical expansions have been stimulated by, and acted as temporary solutions to, diminishing opportunities to extract surplus value from externally conceptualised 'Natures'. Conceptualising nature as an externality, as capitalism does in Moore's view, allows its 'wealth'—conceptually 'free gifts' in the form of the 'Four Cheaps' of fuel, food, labour power, and raw materials—to be 'mapped, reshaped, and appropriated cheaply' (2014: 288–89). Within capitalism as 'a way of organizing nature', Moore writes, it is not simply waged labourers who work, but rather, capital compels 'all life activity' to 'work' within its system of value relations (2015: 2, 225). As such, Moore notes, capital's law of value is actually the 'Law of Cheap Nature' (2015: 53), the uppercase 'N' signifying the Nature that is conceptually externalised, as opposed to lowercase 'nature' as it biophysically exists. Moore describes this 'nature' in terms of the 'web of life,' or the 'totality of distinctive and interpenetrating evolutionary trajectories' of all life on earth (2015: 12); it is this web of life which capital must compel to work ever-harder. At the same time, Moore argues that today the 'accumulation of socio-ecological contradictions in life, capital, and power over the past five centuries'—of which petromodern novelties such as the spectre of 'peak oil' and the measurable impact of atmospheric pollution must be understood as

comparatively recent symptoms—bespeaks the closure of what Moore characterises as the 'Great Frontier' of 'Cheap Nature' (2015: 13, 165).

If, as Claire Westall points out, for Moore it is “‘peak appropriation’”, or ‘the exhaustion of capitalism’s ability to appropriate everything that previously constituted world-ecological surplus,’ which comprises ‘the fundamental problem facing capital today’ (2017: 270), the astrofrontierist, off-world extractivist imaginaries of *Destination Moon* and *Farmer in the Sky* continue to resonate with the closure of the Great Frontier and the consequent ‘world-systemic crisis of capital’ (Westall 2017: 266). Read in terms of world-ecology, Barnes’s warnings to his co-investors and the urgent terms in which he frames the necessity of the rocket project, as much as they might gesture towards the moon’s Cold War strategic significance, also posit it as the site of the next great capitalist wave of extractive expansion, however glancingly. As Barnes puts it, the effort is financially worthwhile and his investors will find out exactly how ‘when we get back.’ Macdonald’s assertion that ‘petroleum culture is consistently haunted by its eventual depletion’ has some purchase here (2013: 13). Sure enough, the explorers discover significant deposits of lunar uranium, as a potential oil replacement, in a moment which reconfigures the lunar landscape, previously described in the film as ‘utter barrenness and desolation,’ as a strategically important energy frontier, albeit accompanied by the ominous clicks of a Geiger counter. Like the potential destruction leaked by the atom-driven rocket, this gesture punctures this otherwise energetically promising moment. Though the film’s discussion of the astrofrontier’s potential remains exploratory, its positioning of the lunar uranium frontier as the site of a potential ‘world-ecological revolution’ (Moore, 2015, 113) is evident, despite being somewhat buried in its energy unconscious.

Heinlein’s *Farmer in the Sky* picks up in an imagined twenty-first century where *Destination Moon* left off. After the kinds of initial forays depicted in the film, humanity, once again led by the US, has begun to colonize the solar system. Here, much of the energy-angst obliquely apparent in *Destination Moon* is framed in more explicit terms. The novel was written over 20 years before the Club of Rome’s *The Limits to Growth* (1972) popularised the limits thesis—an understanding that the closed earth system forms a limit to accelerating commodification, resource use,

and population growth. Following the successful launch of *Sputnik* in 1957, Hannah Arendt echoed a common view that despite the 'uncomfortable military and political circumstances', *Sputnik* represented a potential 'escape from men's imprisonment to the earth' (1958: 1). As Kilgore notes, liberated German rocketeers had hoped that the military-industrial complex could be re-directed to 'wage a peaceful war against the limits imposed by the natural world' (2003: 51). As much as 1950s US astrofuturist modes may have been imbricated in Cold War politics, the idea of "escaping" earthly limits also informs their rhetoric and aesthetics. (It also reveals a simultaneous anxiety pertaining to such limits). As discussed above, for Moore, the limit of the closed earth system does not relate to depletion in an abstract sense (as it does in *The Limits to Growth*), but rather 'the peak "gap" between the capital set in motion to produce a given commodity and the work/energy embodied in that commodity' (2015: 106), that is, 'the limit of putting nature to work,' either 'for free, or at a very low cost' (2015: 13). We can discern in the novel a precursory acknowledgement of this limit through the way in which Heinlein's story frames the extraterrestrial frontier as a means to transcend it. A terraformed Ganymede does not simply offer a space in which there is more material "stuff" but an arena in which the biophysical realities of the web of life may be manipulated *ad infinitum* such that the limit of putting nature to work need no longer apply.

By contrast, the earth in Heinlein's future is energy-poor, 'powered-down' (Macdonald 2016: n.pag.) by hunger. At the novel's outset, Bill tells us that food rationing in America had been 'cut another ten calories' (Heinlein, 1967: 8). As Macdonald notes, SF's 'extremes' of either "'powered-up" excess and expenditure or of "powered-down" entropy and disaster' demonstrate 'more than a vestigial trace of an *apparently* unsustainable world' (2016: n.pag.; original emphasis). Even in the 1950s moment of powered-up acceleration within the US, *Farmer in the Sky* builds-in an early recognition of this moment's unsustainable waste by presenting earthbound humanity existing on 'the ragged edge of starvation' (Heinlein, 1967: 154). The theme of food- and resource-starved humanity has recurred multiple times since, and remains very much a contemporary concern, as other essays in this issue make apparent. Christopher Nolan's recent film, *Interstellar* (2014), for example, sees

humanity's remaining food-crops dying out one by one after resource 'food wars' have decimated the world's population. Just like Nolan's more recent film—whose protagonist, Joseph Cooper, pronounces that 'mankind was born on earth: it wasn't meant to die here'—*Farmer in the Sky* offers Ganymede as 'a brand new planet,' emphasised as a single-sentence paragraph (Heinlein, 1967: 8). George Monbiot, in a review of *Interstellar*, argues that Cooper's statement '[w]e're not meant to save the world. We're meant to leave it' reflects 'the political defeatism of our age: that adapting to climate breakdown is preferable to stopping it' (2014, n.pag.). Even if, as Macdonald writes, SF can offer 'visions of worlds where a wholly new system of *radical* sustainability and non-polluting infrastructure' (2016: n.pag.; emphasis in original) are possible, the ostensible radical sustainability in *Farmer in the Sky* hinges on a similar defeatism. Bill completely abandons earth and when one character asks what the answer is to earthside resource problems, another responds bluntly 'there isn't any!' (Heinlein, 1967: 154). By joining the extraterrestrial colonization effort, Bill is offered the chance to 'escape' calorie-poor earth and, on Ganymede, has more food than he can eat, waxing lyrical about 'cream so thick I didn't know what it was,' having 'tried to try everything' (Heinlein, 1967: 78). This counterpoises the astrofrontier as ostensibly limitless—as we soon learn, the Ganymedean terraformers have already set their eye on Callisto, a neighbouring Jovian moon (Heinlein, 1967: 84). The novel therefore remains imbricated in the kind of expansionist and extractivist logics it tacitly critiques as unsustainable.

For John Rieder, the concept of terraforming 'melds technological and geographical frontiers' into an ultimately 'inexhaustible form' (2015: 173). Both *Interstellar* and *Farmer in the Sky* offer ostensibly radically sustainable solutions to this problem by imagining limitless universes as new 'Great Frontiers' of Cheap Nature (Moore, 2015: 165), whose statuses as *tabulae rasae* offer an opportunity to re-design the web of life and create new Natures in ways conducive to accumulation. In Heinlein's novel, vast quantities of energy are accessible through 'mass-conversion' (1967: 52), which facilitates not only interplanetary travel, but terraforming. Here, the greenhouse effect, which, while not as pressing a political concern or as high in public consciousness in the 1950s, is nevertheless repurposed as beneficial to the

extraterrestrial colonization: 'the most important part of the atmosphere project' on Ganymede (1967: 72). Optimistically, high-powered and efficient sources of energy drive the development of new technologies which allow mankind to leave earth, refashion cold worlds into liveable ones by inverting the climate change problem as an opportunity, and then, to generate new caloric reserves as such terraformed worlds offer limitless space to grow food.

The problem of 'metabolic rift,' which John Bellamy Foster has described as 'the estrangement of human beings in capitalist society from the natural conditions of their existence' (1999: 383) is sidestepped, by creating new regimes which can support an understanding of the future, and of the key organisational principle of life itself, as a horizon of limitless economic growth. In this way, *Farmer in the Sky's* Ganymede reads as a coded allegory of the promise of the Great Acceleration and the contemporaneous petrochemically-infused green agricultural revolution. What hardly needs stating at this point is of course that this is hardly a radically new mode of sustainability, but rather, as in Monbiot's critique of *Interstellar*, a fictional sleight of hand which imagines that at some point human technical ingenuity will be able to re-set world-ecological parameters. Mass converters turn matter itself into energy and will 'eat anything' (Heinlein, 1967: 97), enabling the creation of a kind of 'perfected' nature that is suited to humanity's energetic appetites and is ultimately framed as an emancipatory project. On Ganymede, the absence of competition from weeds and pests, and specially adapted crops, means that sowing crops becomes a 'case of poking a seed into the ground and then stepping back quick before the stalk shot up and hit you in the eye' (Heinlein, 1967: 108). Amid all of this, however, the novel's description of this process is underlain, as in *Destination Moon*, by a lingering sense of violence, which complicates this expansionist rhetoric and suggests, however obliquely, that this kind of acceleration in capitalist regimes is problematic and wasteful. Here, we read back to the mid-century context: while Ganymede may be read as a coded allegory for the agricultural Green revolution's promise, this promise was evidently unsustainable within the closed earth system, necessitating the off-world move in the first place.

Moreover, terraforming the astrofrontier is a profoundly destructive process. The first job, we are told, is to go about 'busting [the surface of the planet] up into little pieces, grinding the top layer to sand, pulverizing the top few inches to flour' (Heinlein, 1967: 99). The repeated use of violently suggestive words underscores the fact that billions of uninterrupted years of geology are obliterated in an instant, even as, paradoxically, the end result, 'flour,' nods toward the agricultural potential of this newly created soil. After the Ganymede landscape is effectively beaten into submission, the second stage of terraforming parallels what Rob Latham has described as the historical 'biotic invasion of the New World' (2014: n.pag.). Echoing the historical introduction of diseases like smallpox, which, along with European agricultural methods, 'resulted in the wholesale destruction of native cultures and ways of life' (Latham, 2014: n.pag.), Ganymede homesteaders 'infect' the soil with 'pay dirt' (Heinlein, 1967: 99). To make pay dirt, just as *Destination Moon* repurposed the atom for notionally peaceful exploration, the terraformers redirect deadly radiation to creative enterprise:

People back on earth would make pure cultures of everything they wanted to keep in the way of bacteria, raise the little worms under laboratory conditions, do the same for fungi and everything else they wanted to save – and take the soil itself and kill it [...] irradiate it, bake it, test it for utter sterility. Then they would take what they had saved in the way of life forms and put it back into the dead soil. (Heinlein, 1967: 114)

Though, as in most hard science fiction, there is a sense of delight here in the lengthy and detailed paragraphs describing the terraforming process, in which totalising technologies are unleashed on earth's soil to both kill *and* breathe life back into it, the sense of excitement is once again problematised by underlying gestures toward catastrophe; physical destruction, radiation, and disease. Within the 1950s moment of powered-up excess, then, we can discern in *Farmer in the Sky* a consistently underplayed, yet nonetheless still present, energy-anxious, limits recognition.

Conclusion: Astrofuturist 'Petromelancholia' and Energy Mixes

Moore writes that 'the accumulation of capital over the *longue dureé* has been a spectacular moment of temporal deferment' (2011: 10). By propagating the hope that mankind will imminently escape the confines of earth and all its inherent limits, *Destination Moon* and *Farmer in the Sky* are complicit in this same kind of deferment, even as simultaneously the astrofrontierist strategies by which they do so encode a recognition of earthly limits. Both texts' optimistic reformulations of the frontier myth are, no doubt, fantasies about overcoming energy limits. The slippages and leakages within their optimism, however, problematize this fantasy as not being quite so straightforward. In particular, they offer imagined future energy-mixes which afford room for both techno-modern and powered-down lifeworlds that are provocative in their ambiguities. Both illustrate that what LeMenager has called 'petromelancholia,' namely an 'unresolved grieving of conventional fossil fuel reserves' (2013: 16), is not confined to the dystopic and post-apocalyptic fictions popularised since the 1970s. As Macdonald has noted, it is 'rare to see an imagined future where less energy' is framed positively, and 'resource cataclysm' is always already embedded in such dystopic texts (2013: 14, 13). *Destination Moon* and *Farmer in the Sky* demonstrate that even in powered-up future imaginaries of *alternative* energetic excess, there is room for petromelancholic expressions. We might pause here, briefly, to remember the ambiguous message of *Destination Moon's* end titles: what exactly is ending in the astrofuturist visions of the novel and film, and what is beginning? Their sense of energy-angst resides in the unresolved tensions between, on the one hand, the petromodern assumptions driving their rhetoric and, on the other, the task of translating them to an arena in which oil itself, at least as a source of energy, is insufficient, inaccessible, or non-existent.

On Ganymede, human and animal muscle power becomes as vital a terraforming tool as the mass converters. In *Destination Moon* the high-energy technological sublime codified within the atomic rocket sits in tension with the petro-artefacts it may one day supersede. On Ganymede, it sits in an uncomfortable tension with a nostalgically framed return to a pre-petro-accelerationist vision of the frontier 'as

Americans want to remember it—a place of sturdy yeoman farmers' (Abbott, 2005: 247). Here, however, there is 'no lumber. No sheet metal. No insulation. No wires. No glass. No pipe'. The only construction material available is good 'old-fashioned country rock' (Heinlein, 1967: 85). Bill acknowledges that the pioneers of the mythic west also had it tough, but points out that 'they weren't on Ganymede,' highlighting that any challenges faced by extraterrestrial colonists are much more difficult (Heinlein, 1967: 86). The petromelancholia of Ganymedeian colonization is expressed through the settlers' loss of earthly petrocultural comforts, and their struggle to de-acclurate from their everyday omnipresence. Mobility is severely restricted, with only three tractors to serve the needs of over thirty-thousand colonists. If on earth, the twenty miles to the nearest available land is 'a few minutes by tube' or an 'up-and-down hop for a copter,' Bill is somewhat less enthusiastic about walking the twenty miles there and back again (Heinlein, 1967: 86). A lack of land processing machinery means that a homesteader may have to wait years before having a chance to 'process his first acre of ground,' leading one to claim that 'we've been swindled!' and others to demand to be returned to earth (Heinlein, 1967: 86).

The latter half of *Destination Moon* is similarly devoted to the astronauts' attempt to return to earth. This is framed in explicitly depletionist terms as a fuel problem, without which the astronauts will suffocate, dehydrate, or starve. Their desire to return home, then, inverts Cooper's naively astrofuturist statement in *Interstellar* that mankind was born on earth but not meant to die there, and evinces a kind of melancholia for a time that once was. This is not simply a longing for home, but an understanding of *earth* as necessary for human survival. Their solution rests in partially dismantling the rocket itself, jettisoning, like in *Farmer in the Sky*, its interior comforts and technological artefacts to sufficiently lighten the load. This partial rejection cuts against the grain of the film's heretofore energy-expansionist rhetoric, in the same way that, on Ganymede, the actual reality of the post-oil astrofrontier counterbalances its promise of 'free land and a chance to raise our own food' (Heinlein, 1967: 83).

For Szeman, 'instead of challenging the fiction of surplus [...] literature participates in it just as surely as every other social narrative in the contemporary era' (2011: 324). He argues that we must instead urgently 'generate ideas of how a world of seven billion

people might use oil to different ends and for different purposes' (2013, 160). Both *Farmer in the Sky* and *Destination Moon* neither present wholly powered-up visions of future astrofrontierist energetic excess, nor do they present the kinds of neo-luddite fantasies of a pre-petrolapsarian arcadia typical of eco-apocalyptic narratives. Rather, they throw both of these into their imagined future energy-mixes. *Farmer in the Sky*'s tension between the high-power world of space travel and terraforming, versus the low-power world of subsistence farming—both bracketed by the extractivist and expansionist logic of petrocapitalism in the 1950s accelerationist moment—gestures towards the kind of challenge Szeman identifies. Of course, in the novel and film, the perpetuity of capital's systemic extractivism is never in any doubt. Heinlein's novel figures a failure in the systems warming Ganymede, causing thousands of colonists to freeze to death in scenes reminiscent of the Donner Party tragedy, as nothing more than a temporary setback. The novel's sense of petromelancholia dissipates, and Bill eventually thrives on Ganymede; not despite its powered-down environment, but because of it. The novel ends with his triumphant assertion 'I am where I belong. And I'm going to stay!' (Heinlein, 1967: 174). Likewise, the astronauts in *Destination Moon* return home safely, allowing the film to configure its events as the imagined 'end of the beginning' of capitalist extractivism's new astro-oriented chapter. If 'the Cold War produced a continual simulation of ultimate endings' (LeMenager, 2013: 72), then present-day nuclear posturing notwithstanding, the rising recognition of the fact that capitalism is running out of spaces 'from which "free gifts" [can] be extracted, and into which "free garbage" [can] be deposited' (Moore, 2015: 280), has caused the US astrofuturist imaginary to shift gears, and for rifts and fissures to appear in its optimistic responses to this quite different sense of ultimate ending.

In James Cameron's *Avatar* (2009), for example, we see a reinscription of Ursula K. Le Guin's *The Word for World is Forest* (1976), in which indigenous resistance frustrates resource extractivism. Ridley Scott's *Prometheus* (2012) emphasises the hostility and dangers of outer space, while Alfonso Cuarón's *Gravity* (2013) highlights the dangers of humanity's pollution of low-earth orbit with space junk, to the point at which any further off-world moves may be impossible. Like *Destination Moon*, Scott's *The Martian* (2015) centres less on expansion than on returning a stranded American astronaut home from the red planet, but unlike the earlier film, the prospect of any

return to Mars afterwards seems far-off at best. In Nolan's *Interstellar*, the prospect of humanity's move off-world is heavily circumscribed by personal suffering, danger, and the very real possibility of death in hostile extraterrestrial environments. At the same time, however, a number of fledgling astrobusiness are propagating their own kind of space ambitions, which, in the same vein as *Destination Moon's* Jim Barnes, deploy classic astrofrontierist speculative gestures toward an imminent, benign, powered-up, interplanetary future.

In 2016, Planetary Resources, for example, claimed that 'asteroids will unlock the Solar System's economy' and that the resources of these rocks will 'enable economic growth in the same way new resource frontiers have been explored and developed here on Earth' (2016: n.pag). On the one hand, *Destination Moon* and *Farmer in the Sky* encode the same frontierist, neo-imperial extractivist logic. On the other, this rhetoric is problematised by multiple deflationary gestures and ambiguous energy mixes that at once embrace petromelancholia and a kind of opposite petroeuphoria. The space of possibility that hangs between these two poles may offer us a way in to thinking beyond capital's systemic grasp and forms an urgent site of enquiry into SF's literary energetics. Though astrofuturist SF, in its various guises throughout the years, may be invested in projecting forward the 'bad faith of the present' that 'we can continue to be who we are now' under different energy systems (Szeman, 2011: 325), at the same time, it also contains an acknowledgement that the necessity of living "beyond" oil offers the potential to transform who we are and how we experience the world (or, indeed, worlds) within the energy unconscious of its always-already post oil imaginaries.

Acknowledgements

I would like to thank the UK Arts & Humanities Research Council and the White Rose College of the Arts and Humanities for funding the research which supports this article. I would also like to thank Dr Claire Westall for her supervision of the MA dissertation that eventually became this article, as well as Dr Caroline Edwards and Dr Graeme Macdonald for their helpful feedback during the editorial process. Finally, I would also like to thank my two anonymous reviewers for their perceptive feedback on the initial draft, including alerting me to the parallels between *Avatar* and *The Word for World is Forest*.

Competing Interests

The author has no competing interests to declare.

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How to cite this article: Lubek, T 2019 Cold War 'Astrofuturism' and 'Energy-Angst' in *Destination Moon* and Robert Heinlein's *Farmer in the Sky*. *Open Library of Humanities*, 5(1): 55, pp. 1–31. DOI: <https://doi.org/10.16995/olh.121>

Published: 13 September 2019

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