

“Space Became Their Highway”: The L-5 Society and the closing of the Final Frontier

by
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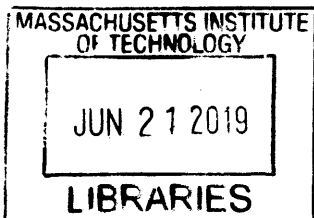
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“Space Became Their Highway”: The L-5 Society and the closing of the Final Frontier

“Oh give me a locus where the gravitons focus
where the three body problem is solved
where the microwaves play down at three degrees K
and the cold virus never evolved.”

-*Home on Lagrange*¹

“Mars ain’t the kind of place to raise your kids”

-Elton John, *Rocket Man*²

Introduction

In the 1970s in America, outer space became the locus for many imaginings of the future, from Gene Roddenberry’s *Final Frontier*, to George Lucas’s *Galaxy Far Far Away*, to NASA’s own predictions for the future of manned space travel. Outer space has long held a sort of mystical sway over the human imagination. Throughout the 19th and 20th century, it has been the realm of science fiction and futurist imaginings alike- almost as if we want to fill the void with fantastical technologies and speculative civilizations. But in the Apollo Era especially, space took on a particularly vivid role in the popular consciousness – a vast new frontier just at the edge of humanity’s reach. The question of what was out there, or what could be out there, was a compelling one for many Americans – whether they seriously believed in the possibility of space colonization or not. The 70s vision of the future of space travel was a fraught site for many social conflicts, ranging from large geopolitical ones – would the future of space be American or Soviet? – to more local cultural ones – would space colonization and space flight support the values of the mainstream culture, or the counterculture, in America? In this paper, I explore 1970s hopes, fears, and imaginings for space through the lens of a particularly dedicated group

1 “Home on Lagrange,” in *The New England Science Fiction Association Filk Hymnal*, Cambridge, MA: New England Science Fiction Association, 1990.

2 Elton John, “Rocket Man,” on *Honky Chateau*, Uni, 1972.

of 1970s space enthusiasts: the L-5 Society, and their vision for a self-sufficient space station, located at earth's 5th Lagrangian point.

In *Dreamscapes of Modernity*, Sheila Jasanoff calls for historians of science to study not only the history of actual technologies, but also what she refers to as “sociotechnical imaginaries” - historical imaginations of technologies which didn't quite exist yet.³ By Jasanoff's definition, a sociotechnical imaginary is a sort of imagined landscape which a society constructs in order to explore the implications of current or future technologies. Sociotechnical imaginaries may be placed in the future, or in far away unexplored places; only, like Thomas More's utopia, or “no place”, they must be somewhere we can't go – at least not yet.⁴ In her analysis, Jasanoff argues that sociotechnical imaginaries are rarely constructed by lone visionary authors. Instead, they are collaborative works of worldbuilding which members of a society all contribute to shaping. While core texts like works of science fiction, utopian novels, and economic or sociological predictions of the future can have a major role in shaping sociotechnical imaginaries, individual's beliefs about technology and the future help shape how these texts are read. And these individual's reactions to and interpretations of these texts are what transform them from isolated pieces of writing into a landscape in the collective imagination. Furthermore, Jasanoff argues, the collaborative nature of sociotechnical imaginaries makes them a useful tool for historians. Because sociotechnical imaginaries are constructed collectively, they are often sites of negotiation, sandboxes where cultural conflicts over beliefs about, and hopes and fears for, new technology can be fought out, explored, and potentially reconciled. For these reasons, sociotechnical imaginaries often reveal contemporary cultural fissures and conflicts in a society that manifested in concerns about technology and the future. Though sociotechnical imaginaries may be entirely fictional, they are still worth taking seriously because they are constructed by real people, and reflect real conflicts in the real society that created them.

The L-5 Society, which existed from around the years 1975 to 1984, was a particularly dedicated group of somewhat counterculture aligned space enthusiasts who seriously believed in the possibility that they would get to live in outer space within their lifetimes. Because of their

3 Sheila Jasanoff, “Future Imperfect: Science, Technology, and the Imaginations of Modernity” in *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, ed. Sheila Jasanoff and Sung-Hyun Kim, (Chicago; London: The University of Chicago Press, 2015).

4 Ibid, and Thomas More, *Utopia*, 1516.

serious belief in this possibility, the members of L-5 spent a great deal of time and energy hashing out the details of their imagined space colony (a green and self-sustaining asteroid-mining colony following a set of designs proposed in 1974 by theoretical physicist and NASA consultant Gerard O'Neill). In the process, they created one of the more vivid and fully fleshed out dreamscapes of space colonization of the late 70s – a vision, which remains influential in science fiction and sociotechnical imaginings of space today (though actual belief in its plausibility may have dwindled). Thus, it is an ideal sociotechnical imaginary for studying the mundane cultural concerns involved in the civic planning of a colony in space. In the first chapter of this paper, I survey the previous literature on the L-5 Society, and lay out both the history of the society and their imagined space colony, as well as its position relative to the 1970s counterculture. I argue that we can view L-5 as a fundamentally utopian project, but also a municipal one: Members of L-5, despite their political alignment, shared a dissatisfaction with something about the mundane reality of their current lives and the society they lived in, and were excited about space as an opportunity to start from scratch and establish an alternative society, down to the city planning details. Many members of L-5 felt that the available landscapes of 70s life, the suburbs and the inner city, did not afford them the freedom of self-determination and self-expression, and, even more profoundly, a sense of meaningfulness or spirituality in their lives, and saw space as a landscape that, simply by virtue of its geography, would offer them these things.

In my analysis of the L-5 Society, I draw on the literature on another landscape which has often been important throughout American history – the Frontier. The Frontier is also a sort of imaginary landscape, and is perhaps the most studied sociotechnical imaginary in American history. It is the landscape of just beyond the edge of civilization, to the West. It has historically been a landscape that has supported a particular set of utopian values: freedom, self-reliance, and a connection with nature untainted by industrialization. In the 60s and 70s, the Frontier narrative was, often quite explicitly, applied to space and the possibility of space colonization – in fact, the phrase “The Final Frontier” is so familiar to us that we may barely think of it as a choice at all to characterize space as a frontier. In the second chapter of this thesis, I explore the literature on the Frontier as a sociotechnical imaginary, starting with Fredrick Turner’s *The Significance of the Frontier in American History*. I argue that in the 1970s, the Frontier was a very appealing image

to not only members of the mainstream culture, but also the counterculture, and demonstrate how the L-5 Society used frontier language to very explicitly align their vision of space with the utopian imaginary of the American West.

However, the L-5 Society's dreamscape was also a highly contested one – the collapse of the society in 1984, is often attributed to internal conflict over the vision between the more and less countercultural members of the society, as well as dwindling excitement for space colonization in the broader culture.⁵ While previous scholars of L-5 tend to argue that the most dramatic conflicts split the society across political or culture/counterculture lines, I argue that many of the most prominent dilemmas the L-5 Society encountered were often more complicated, with individual members of L-5 holding opposing values which they attempted to balance and negotiate through the process of worldbuilding. Drawing on records of the internal worldbuilding conflicts in the L-5 Society, the choices they made in representing their vision to the outside world, and the way that the sociotechnical imaginary of L-5 morphed and evolved over the first few years of the society's existence from 1975 to 1977, I argue that, while the L-5 society's hope for space colonization may have been a wacky, fringe belief, the major social conflicts that L-5's dreamscapes struggled with and attempted to address were not very different from the dilemmas that defined 1970s culture wars at large: Is industrialization and consumer capitalism liberating or soul crushing? What should the relationship between technology and nature be? And what is the correct balance between individualism and collectivism? I ultimately argue that part of the reason for conflict in the L-5 Society was not only that different members held different political or cultural beliefs, but also that individual people in the 1970s often wanted contradictory or complicated things out of Space, the Frontier, or their utopian landscape of choice – and that L-5 was a dreamscape where these conundrums could be poked and prodded at, explored, or simply laid out plainly next to each other, in a tangible hypothetical.

5 Patrick McCray, "Building Castles In The Sky" in *The Visioneers: How A Group of Elite Scientists Pursued Space Colonies, Nanotechnologies, and a Limitless Future*, (Princeton: Princeton University Press, 2013) and Peter J. Westwick, "From the club of Rome to Star Wars: the era of limits, space colonization and the origins of SDI" in *Limiting Outer Space: Astroculture After Apollo*, ed. Alexander C. T. Geppert, (London: Palgrave MacMillan, 2018)

Home on Lagrange: The L-5 Society

In this paper, I will focus on the L-5 Society as a particularly extreme case study which illustrates several general trends in how Americans were thinking about outer space in the 1970s. The L-5 Society was a particularly radical example of 1970s space enthusiasm, the most prominent of a series of small groups in a loose network of amateur space enthusiasts that is often referred to as the “pro-space movement” – that is to say, groups of people who very seriously believed that humans would colonize outer space within the next twenty odd years, and that there was a very good chance they would personally get to live there within their lifetimes. The L-5 Society was the largest, most publicly well known of these groups. Their particular vision for space colonization was for a totally self-sufficient, solar-powered, asteroid-mining space colony, based on a series of speculative designs for a space habitat created by the NASA physicist Gerard O’Neill, between 1974 and 1976. The L-5 Society is rather well documented, and thus rather well studied, for a pro-space group. Patrick McCray and Peter Westwick have both written thorough academic histories of the society, and David Brandt-Erichsen, a former member, has written a rather extensive amateur history as well.⁶ Additionally, the entirety of the L-5 Society’s newsletter, *L-5 News*, various other publications of the society, and interviews with members, are available online (also maintained by Brandt-Erichsen and his organization).⁷

Putting L-5 in context, the mid-70s were a complicated time for space enthusiasm. On the one hand, space travel was certainly a dying industry by the time the mid 70s rolled around. The last Apollo moon missions were in 1972, and even before that, in 1971, Nixon had instructed NASA to limit their scope, cutting back on dramatic new projects.⁸ Even the next round of manned missions, America’s Skylab, had been grounded by 1974.⁹ Though various unmanned probes and satellites followed, the heady thrill of exploration was somewhat deflated now that Americans were not watching actual humans like themselves push the boundaries of what had

6 McCray, *The Visioneers*, and Westwick, “From the Club of Rome to Star Wars,” and David Brandt-Erichsen, “A Brief History of the L5 Society,” in *Ad Astra*, Nov.-Dec, 1994.

7 The entire archive of *L-5 News* can be found online at <https://space.nss.org/l5-news/>. Last accessed 4/9/2019

8 Alexander Geppert, “The post-Apollo paradox: envisioning limits during the planetized 1970s” and Roger D. Launius, “Responding to Apollo: America’s divergent reactions to the moon landings” in *Limiting Outer Space: Astroculture After Apollo*, ed. Alexander C. T. Geppert, (London: Palgrave MacMillan, 2018).

9 Geppert, “The post-Apollo paradox.”

ever been done by humans before.¹⁰ General enthusiasm about and interest in science and exploration was also on the decline. The ongoing Vietnam War lowered the public faith in authorities, and cast scientists in a bad light. Increasingly, weapons of destruction, rather than wonders of exploration, became the dominant popular imagining of technology. Finally, the growing oil crisis in 1973 made many reconsider the merits of blowing huge numbers of taxpayer dollars on posturing and frivolous joy rides to the moon.¹¹ In 1973, Nixon abolished the national Science Advisor position, signaling for many the end of government support of science – and of science and technology as a source of national pride.¹²

However, for a small group of enthusiasts, this atmosphere of gloom, doom, and crisis only helped to strengthen enthusiasm about space – if we don't have the solutions here, many believe we can find them up there.¹³ These technologists perceived the death of the Apollo program not as an ending, but a new beginning, an opportunity for the space program to rise, phoenix-like, into a new era of exploration.¹⁴ Though practical visions of near-future space travel might have been on the decline, fantastical ones abounded, as evidenced by the sci-fi blockbusters of the mid-seventies: *Star Wars*, *Close Encounters*, *Battlestar Galactica*, *Moonraker*, and the like.¹⁵ And for a period of such general malaise, the years from 1975 to 1977 were a period of surprising enthusiasm about space settlement and colonization. Peter Jankowitsch, then the Australian Ambassador to the UN Outer Space committee, acknowledged this worldwide excitement when he wrote in 1976 “within the past year, a new dimension of our thrust into space has become the object of public discussion. It is called *space* colonization.”¹⁶ In 1974, Gerard O'Neill, a Princeton physicist, proposed his vision of a self-sufficient space station, located at the L-5 Lagrange Point, and in 1975, NASA funded O'Neill to head a study on the possibility of space colonization.¹⁷ O'Neill even testified before congress, and the plan was endorsed by several well-known political figures, including the well-known Arizona senator and then presidential

10 Launius, “Responding to Apollo.”

11 Ibid, and McCray, *The Visioneers*.

12 Launius, “Responding to Apollo.”

13 Geppert, “the post-Apollo paradox” and McCray, *The Visioneers*.

14 Launius, “Responding to Apollo.”

15 Thore Bjørnvig, “Building outer space: LEGO and the conquest of the beyond in the 1970s” in *Limiting Outer Space: Astroculture After Apollo*, ed. Alexander C. T. Geppert, (London: Palgrave MacMillan, 2018).

16 Peter Jankowitsch, “UN Interest in Space Colonization,” *L-5 News*, January 1976.

17 Launius, “Responding to Apollo,” Westwick, “From the Club of Rome to Star Wars,” and Brandt-Erichsen “Brief History of the L-5 Society.”

candidate, Morris Udall.¹⁸ In the following years, many conferences on space colonization sprung up around America, including the UN Habitat conference. O'Neill's ideas also received a good deal of popular press, from articles in the New York Times, to the cover of Time Magazine.¹⁹ For this subset of space enthusiasts, the impending sense of death for the space program, and doom for the earth in general, merely lit a fire the fires of urgency beneath the rockets of space exploration. It's our last chance, so what if it's a crazy idea, what have we got to lose?

The early 1970s saw a huge expansion of grass-roots pro-space activism. According to Trudy Bell, a science writer of the late 70s, at its peak the pro-space movement in America had around 40,000 members, organized into 42 space interest organizations: The Committee For the Future, The National Space Institute, the International Society of Free Space Colonizers, Space Now, and, largest and most well known, the L5 society.²⁰ Most of these organizations were small, diffuse, community efforts, with chapters around the United States, mainly in east- and west-coast cities and colleges, which circulated newsletters, ran community education initiatives, encouraged members to speak at conferences and write op-eds, and lobbied the government to approve spending on space exploration.²¹ The pro-space movement was somewhat of a motley crew, a combination of counterculture types, new leftists, emerging libertarians, and other individualists who wanted to get away from the rigid structures of earth and build something entirely new out on the High Frontier.²²

The L-5 Society was one such group, founded by Keith and Carolyn Henson of Arizona. In 1974, the Hensons read an article titled "The Colonization of Space" in *Physics Today*, by a physicist, Gerard O'Neill.²³ They were so inspired by the visions of space colonies presented in the article that they went the next year to see O'Neill speak at Princeton, and, within a few

18 Brant-Erichsen, "Brief History of the L-5 Society" and Michael A. G. Michaud, "Reaching For The High Frontier: The American Pro-Space Movement 1972-1984." <http://space.nss.org/reaching-for-the-high-frontier-the-american-pro-space-movement-1972-84/>. Last accessed 12/13/2018.

19 Westwick, "From The Club of Rome to Star Wars."

20 Patrick McCray, "Timothy Leary's transhumanist SMILE," in *Groovy science : knowledge, innovation, and American counterculture*, ed. David Kaiser and Patrick McCray, (Chicago; London: The University of Chicago Press, 2016.), and Launius, "Responding to Apollo."

21 Ibid.

22 McCray, *The Visioneers*.

23 Brandt-Erichsen, "Brief History of the L-5 Society" and Ed Regis, *Great Mambo Chicken and the Transhumanist Condition*, (Reading, Mass: Addison-Wesley Pub. Co., 1993).

months, founded a society and began circulating a newsletter, devoted to making O'Neill's vision a reality. The society's mission was to "educate the public about the benefits of space communities and manufacturing facilities" and to lobby the government for funding to support space colonization projects. Their original charter declared the ambitious, perhaps hubristic, goal "to disband the society in a mass meeting at L-5."²⁴ At its peak, the L-5 Society had 4,000 members, local chapters in most major east- and west-coast cities, and the support of such prominent political figures as Barry Goldwater, Stewart Brand, Morris Udall, Robert Heinlein, and Timothy Leary.²⁵ It sent presenters to major international conferences such as the UN Habitat Convention, and, according to some, scored victories in congress on an international scale, perhaps taking an instrumental role in the US not signing the 1981 UN Moon treaty.²⁶ It is often credited with paving the way for the SDI, solar powered satellites, space weaponry, and a numbers of other space based technologies.²⁷ It lasted for a brief ten or so years, from around 1975 to 1984, and then vanished as quickly as it had appeared, splintered into a number of new organizations. At its peak contained an impressive cross-section of hippies, libertarians, and pretty much any group that took issue with the establishment or status quo – held together by the vision that "they really would get the chance to personally live in space in their lifetimes."²⁸

Keith and Carolyn were typical alternative kids, trying to live off the grid and control their own lives and environment. They met at the University of Arizona, lived out in a ranch house in a neighborhood which could be described either as a farm, or the suburbs.²⁹ They certainly did their darnedest to make it feel on the "farm" side, raising their own rabbits and goats, and making their own cheese.³⁰ They were taken with the DIY Whole-Earth-Catalog ethos of the 70s, albeit sometimes more for fun than for practical use: they build Tesla coils in their own back yard, and would go out to the desert every weekend with a club of their friends from the University of Arizona, in order to set off explosives and Lord-of-The-Rings-esque fireworks shows. ("Before the SDS³¹ ruined it for us," said Carolyn in an interview "you could just go

24 Keith Henson and Carolyn Henson, *L-5 News*, September 1975.

25 McCray, *The Visioneers*.

26 Brandt-Erichsen, "Brief History of the L-5 Society," and Michaud, "Reaching for the High Frontier."

27 Westwick, "From the Club of Rome to Star Wars," and Brandt-Erichsen, "Brief History of the L-5 Society."

28 Brandt-Erichsen, "Brief History of the L-5 Society."

29 McCray, *The Visioneers*.

30 Regis, *Great Mambo Chicken*.

down to the Apache Powder Company and buy whatever you wanted.”).³² But even with the nigh-ultimate freedom afforded to them by the wide open plains of the Arizona frontier, their quest for freedom and autonomy often ran up against the constraints of society and life in proximity to other humans: neighbors often complained that the Henson’s Tesla Coils “disrupted TV reception all over the neighborhood,” or that their goats had escaped and snuck into other houses to menace neighborhood tablecloths.³³

In order to discuss the politics of the L-5 Society, it is essential to lay out a more precise definition of “counterculture.” The historian Fred Turner warns that modern historians often use the word “counterculture” to conflate two distinct groups in the 60s and 70s which existed in opposition to the mainstream, more socially conservative, culture.³⁴ On major part of the counterculture was what is often referred to as the New Left, made up of radically leftist, socialist leaning groups like Students for a Democratic Society and the Yippies – the portion of the counterculture involved in the civil rights movement and college campus protests. The other half was the more economically conservative, emerging libertarian technocratic DIY movement, headed by figures like Stewart Brand and Timothy Leary – the Whole Earth Catalog crew. Culturally, these groups shared some similarities – they were all growing their hair out and smoking pot – but they considered themselves very distinct politically. Overall, the L-5 Society located itself somewhere between this second group, the libertarian half of the counterculture, and the growing mainstream libertarian right, but maintained its ties to the countercultural new left as well. The society was mostly made up of rebellious young folks like Keith and Carolyn, at universities, or recently graduated, and mostly in the western United States: California, Arizona, Nevada.³⁵ A 1983 poll found that 31% of the society identified as Republican, 2% as Democrat, 8% as Libertarian, and 33% as none of the above.³⁶ Morris Udall described the membership that

31 Students for a Democratic Society, a radical leftist group behind many of the college-campus protests of the 1960s, which was often depicted by right-leaning media as dangerous leftist instigators.

32 Regis, *Great Mambo Chicken*.

33 Ibid.

34 Fred Turner, “Don’t Be Evil: Fred Turner on Utopias, Frontier, and Brogrammers,” *Logic #3*, 2018, <https://logicmag.io/03-dont-be-evil/>, Last accessed 4/9/2019.

35 McCray, *The Visioneers*.

36 Westwick, “From the Club of Rome to Star Wars.” These numbers may represent a more republican makeup than L-5 had at it’s peak, as the society drifted more conservative by the time this poll was taken than it was in 1975.

same year as “5% Democrat, 5% Republican, and 90% anarchist.”³⁷ Issues of *L-5 News* are full of libertarian jokes and jibes about taxation and government inefficiency. One month’s reminder to buy subscriptions of *L-5 News* for friends reads “celebrate [Income Tax Day] by sending [gift] subscriptions to people who want to move to the Asteroid Belt to escape government taxation,” and the next one starts “the next big holiday approaches with the speed of a government bureaucrat trying to resolve an oversight in the fiscal ‘77 budget. You guessed it – April Fools Day.”³⁸ Timothy Leary also served time on the board of directors, and Stewart Brand (who an article in the May 1976 issue of the *L-5 News* refers to as “Out Man In The Counter Culture”) was active in the society and provided support for it through the Points Foundation, his philanthropic organization for investing in alternative-futurist technologies.³⁹ But the L-5 Society also had the support of mainstream, more conservative figures: Barry Goldwater served on the board of directors, and urged congress to consider O’Neill’s proposal for Solar Powered Satellites.⁴⁰ Presidential candidate Morris Udall also publicly endorsed the society at Carolyn Henson’s request and promised to support space colonization efforts.⁴¹ However, other details in *L-5* newsletters newsletters point to leftist concerns and more hippie-like cultural references. Frequent contributors to *L-5 News* would object to the use of gendered or racially biased language in government proposals for space colonization, suggesting an alliance with the feminist and civil rights movement. And a bumper sticker slogan contest in an early issue of *L-5 News*, included suggestions like “L5-Let’s Get High” and “Sex at Zero-G”, a detail that McCray argues points to the youthful, rebellious spirit of the hippies, and the cultural markers of the sexual and psychedelic revolutions.⁴² Thus, despite, or perhaps because of, its very fringe aspirations of space colonization, the L-5 Society spanned an impressive array of political and cultural groups, all joined under a promise of total unrestricted individualism in space.

37 McCray, *The Visioneers*.

38 Unknown Author, *L-5 News* Feb, 1976 and March, 1976, Ironically, the L-5 society itself was initially “operating under the tax exempt aegis of the Campus Christian Center at University of Arizona” (*L-5 News*, Mar 1976)

39 McCray, *The Visioneers*, and Robert Anton Wilson, “Our Man In The Counterculture,” *L-5 News*, May 1976.

40 McCray, *The Visioneers*, and unknown author, “Senate Hearings On Solar Power From Satellites,” *L-5 News*, Jan 1976.

41 Brandt-Erichsen, “Brief History of the L-5 Society” and Morris Udall, “Moris K. Udall Gives Support to O’Neill,” *L-5 News*, Sept 1975.

42 McCray, *The Visioneers*, and unknown author, “Bumper Sticker Contest,” *L-5 News*, April 1976.

The Hensons themselves in many ways illustrate the L-5 Society's complicated and plural position between emerging libertarianism in both the mainstream and counterculture, and the new left. They had both been vocal opponents of the Vietnam War, and the two of them learned the art of grassroots organization and newsletter writing from the anti-war movement in their college days.⁴³ Carolyn also had an environmentalist/feminist streak. She would publish articles in *L-5 News* touting the environmental benefits of space travel, and would insist on L-5 publications using "piloted" rather than "manned" to discuss space flight. One L-5 member reports that she would even breast-feed her baby at the mostly-male aerospace conferences that the society attended.⁴⁴ However, the Hensons were far from long-haired, anti-capitalist, tree-huggers. Carolyn and Keith were certainly not opposed to industry and capitalist ventures. They were also Arizona cowboys who loved the works of the libertarian sci-fi writer Heinlein and owned an extensive firearm collection.⁴⁵ At the time they started the L-5 Society, they had recently founded an engineering firm which designed machines for mining companies.⁴⁶ What united these two fairly dissimilar cultures and outlooks on the world for the Hensons was the spirit of individualism: they wanted to live their own lives the way they wanted to live them, and didn't want anyone else to tell them what to do.⁴⁷

The L-5 Society was not the only organization of its type, but was the largest one, with the widest appeal. In total, there were some 39,000 people in the United States by the end of the 1970s who considered themselves to be members of the "pro-space" movement, but these people were often isolated, or splintered into some 42 organizations.⁴⁸ The L-5 Society was one of the only ones to amass a following of several thousand, spread across many chapters. The sort of wide spanning political alliance seen in the L-5 Society was actually fairly rare for pro-space groups – most tended more towards one political extreme or another. Some pro-space organizations, like the following of Timothy Leary's SMI2LE philosophy, were much more clearly aligned with hippie culture, promoting taking LSD and meditating in space in order to

43 McCray, "Timothy Leary's Transhumanist SMI2LE," and Westwick, "From the Club of Rome to Star Wars."

44 Regis, *Great Mambo Chicken*.

45 Ibid.

46 Ibid.

47 McCray, *The Visioneers*.

48 Trudy Bell, in Launius, "Reactions to Apollo."

unlock the inherent psychic capabilities of the human brain.⁴⁹ At the other extreme, an advertisement for their magazine, *Quest*, describes the International Society of Free Space Colonizers described themselves as “the first wave of an emerging hard-core capitalist revolutionary movement which promises to reform the course of two hundred years of history and bring forth the triumphant rise of the creator class both on and of this planet.”⁵⁰ L-5 Society was similarly a little less extreme aesthetically than many of the other pro-space groups, which is often cited as a reason for their popularity. The Center For the Future (CFF), the biggest pro-space organization before L-5, was regarded as everything from a bunch of kooks to an actual “cult” due to its members wacky antics and strong sci-fi utopian vibes.⁵¹ Where CFF members, showing up to congress in Star Fleet uniforms, would be derided, the more presentable L-5ers could get a foot in the door.⁵² Whereas O’Neill refused to be associated with Timothy Leary and his acid-fueled antics (and his insistence on referring to O’Neill as “sexy sexy Gerard O’Neill” in public lectures)⁵³, he was much more open to endorsing the more clean cut, policy savvy L-5 Society. In many ways, L-5 was a more mellow, moderate, and serious group than the rest of the more radical, rebellious, and zany pro-space movement. All of these particulars (the L-5 Society’s broad range of members politically, high visibility in the mainstream culture, and centrist location in the pro space movement) make it an ideal case study for connecting fringe views within the pro space movement to broader 1970s views on space and the future of social organization.

The L-5 Society’s vision for space habitation was heavily influenced by Gerard O’Neill’s space colony designs. In 1974, O’Neill published an study on solar powered satellites and space habitation, and by 1975, his idea had gained popular press, and he was taken on as a consultant with NASA in order to pursue a longer experimental design study of a space habitat, which he outlined in his 1976 book, *The High Frontier*.⁵⁴ O’Neill proposed several designs, including the

49 McCray, “Timothy Leary’s Transhumanist SMI2LE” and Timothy Leary, *Neurocomic*, (Last Gasp Eco-Funnies: 1976).

50 Unknown author, “International Society of Free Space Colonizers (Ad)”, *L-5 News*, April 1976.

51 Launius, “Reactions to Apollo,” and McCray, *The Visioneers*. Note that some members of the CFF later joined the L-5 society, and Barbara Marx Hubbard, a wealthy heiress and founder of the CFF, became one of their major supporters of and donors.

52 Launius, “Reactions to Apollo.”

53 McCray, *The Visioneers*.

54 McCray, *The Visioneers*, and Gerard O’Neill, *The High Frontier: Human Colonies in Space*, (New York: Morrow, 1976).

O'Neill Cylinder and Stanford Torus. O'Neill's space stations were all designed to be free floating at the Lagrange Points—points in orbit balanced between the earth, moon, and sun such that objects placed there can hang stationary in that location forever without expending energy.⁵⁵ Unlike many earlier pro-space groups, which focused on planetary or lunar colonization, L-5 members embraced O'Neill's idea of building a totally new, free-floating, habitat from scratch. The main appeal of O'Neill's designs for many was that they were completely self-sufficient. Each space station worked like an enclosed ecosystem, like its own version of Earth as framed in Stewart Brand's *Earthrise* photograph. The space stations would be covered in lush greenery in order to recycle their own oxygen and CO₂, and colonists would grow their own food and filter their own recycled water. Any resources which could not be grown would be obtained by mining nearby asteroids, and all electricity would come from solar power, collected at all hours of the day. The habitats would even produce their own gravity, rotating to create areas of earth-like gravity towards the rim, and low gravity towards the center. They would be almost like perpetual-motion machines, spinning silently in the void and holding their position forever, dependent on nobody for resources.

The L-5 Society explicitly claimed to back O'Neill's plan, partially because it was the actual project which was closest to being presented to congress, and therefore the most likely to happen.⁵⁶ But as they collectively took on O'Neill's plan as their own sociotechnical imaginary, attempting to flesh out the specifics of the political and economic arrangements around the colony, and to imagine what everyday life on L-5 would actually look like, the L-5 Society's vision diverged somewhat from O'Neill's original proposal. Not all L-5 members agreed on all these details, and the habitat was imagined very differently in the writings of different members of the society, but by 1976, a few details began to emerge as consensus. Firstly, the L-5 Society selected the L-5 Lagrange point (one of the two points between the earth and the moon) as the location for their space colony, rallying around the name.⁵⁷ They also fleshed out details of the self-sufficient agriculture of L-5: Carolyn Henson (who raised rabbits herself) vehemently

55 O'Neill, *The High Frontier*, and Gerard O'Neill, *Space-based manufacturing from nonterrestrial materials : technical papers derived from the 1976 summer study at NASA Ames Research Center, Moffett Field, California*, (New York: American Institute of Aeronautics and Astronautics, 1977).

56 Unknown author. "O'Neill Testifies Before Congress," *L-5 News*, Sept 1975.

57 Thomas Heppenheimer joked in the January, 1976 issue of *L-5 news*, that if they had chosen the L-3 point "the moon [would be] permanently eclipsed by the Earth, so it could serve as an asylum for people suffering from lycanthropy." (Heppenheimer, "What are Libration Points," *L-5 News*, January 1976.)

insisted on including rabbit meat in the colony's agricultural structure and would repeatedly slip it into the newsletter until it too became a part of the collective vision.⁵⁸ The futurists of the L-5 Society also expanded the scope of space colonization beyond the more modest plans that O'Neil was presenting to the government. Though O'Neill himself was an optimistic visionary and imagined his habitat designs as opening up the possibility of permanent life in space, the plans he pitched to congress were closer to the contemporary exploits of the space program – individual missions which expanded the horizons of earth, but ultimately came back down, maintaining earth as their home base.⁵⁹ To many L-5 members, however, the L-5 colony was a stepping stone to the greater project of space colonization – they planned to go, and never come back. They imagined that in the future, perhaps all humans would be living on space colonies, even going so far as to propose space habitats as a solution to overpopulation. The most enthusiastic members of L-5 believed that space habitats would pave the way for human habitation of the entire cosmos, “generation ships” which would explore other solar systems and galaxies – just the beginning of a vast, unexplored frontier.⁶⁰ Finally, members of the L-5 Society quickly created a consensus on the date – “L-5 by '95! – when humans would be able to live in space: a mere 20 years away.⁶¹ Through the enthusiastic imaginings of the L-5 Society, O'Neill's plan went from a fanciful proposal by a particular author to a fully fleshed out sociotechnical imaginary which the group continued to shape.

One of the main ways this imaginary continued to change over the existence of the L-5 Society was through attempts to propose an economic and social structure for L-5. Initially, the consensus was that using Peter Glaser's designs for solar powered satellites and microwave towers to catch energy beamed down to earth from space, L-5 colonists would pay the government back for their massive investment in the space station in the form of a cut of the

58 Regis, *Great Mambo Chicken*.

59 McCray, *The Visioneers*.

60 Brant-Erichsen, “Brief History of the L-5 Society,” and Isaac Asimov, “Chrysalis: A Community in Space,” in *Space World*, 1977.

61 I have been unable to determine exactly where this estimated date comes from, but it did seem to get around in the counterculture some. The Jefferson Starship song Hijack, about a group of hippies hijacking a privately or government owned space station and riding it off into the cosmos to start a utopian society contains the line “You know - a starship circlin' in the sky - it ought to be ready by 1990 They've been buildin' it up in the air ever since 1980” (Jefferson Starship, “Hijack”, track #4 on *Blows Against The Empire*, RCA Victor, 1970)

nigh-limitless solar power collected in space.⁶² Though O’Neill had pitched the L-5 colony to the government as an industrial project and financial investment, the L-5 Society was the first group to consider how the residents of L-5 fit into this arrangement. The details of the relationship between space colonists and the US government, as well as the timescales of colonization were very much subjects of debate inside the society, and reports on them varied in different articles in *L-5 News* and adjacent publications. In earlier designs, the L-5 community would be more like a colony or mining operation, payed by the government to go up and reap the resources of outer space. Later on, the government investment was often framed more like a loan – L-5 would be a close-to-civilian settlement, with it’s own internal industry, shops, schools, theaters, and the like, and would gradually pay the government back with a cut of it’s output. And, by 1976, it was occasionally proposed that the government should simply build the station and then sell plots of land to individual civilians who wanted to live up there – more like a housing development.

Much of the current scholarship on L-5 is interested in situating the society in a broader history of actual technologies around space travel – for instance, the history of military development versus peaceful development in space, asking how members of the society felt about NASA’s actual proposed actions. Most of this work has focused on the political alliances within L-5, looking at how members of the society with different political leanings were able to work together, and why it fell apart when it did. However, in this paper, I am interested in using the L-5 Society to investigate a different set of questions about space and culture in the 70s – how L-5 members collectively created an imagined landscape in response to their grievances with the actual landscapes of America in the 70s, and how they negotiated their differences (and personal dilemmas) in the process of co-creating this dreamscape. In the rest of this paper, I document the history of how the sociotechnical imaginary of L-5 changed over the course of these debates and negotiations – from frontier mining colony, to semi-suburban housing development. But in order to tell that story, we first need to take a deeper look at its beginnings – Space as the Final Frontier.

62 McCray, *The Visioneers*, and Westwick, “From the Club of Rome to Star Wars.” The safety of these microwave towers was a constant point of government concern whenever the L-5 society’s design was proposed – many critics worried about the danger of microwaves accidentally frying passing ariplanes, or harming the environment by zapping birds out of the sky. In one article reprinted in L-5 news, an L-5 member argues that the towers are not harmful to local wildlife because there have never been dead birds found by the bases of the towers. Though, he admits, it is hard to tell, because there are coyotes in the area.

The Significance of the Frontier In Apollo Era History

The Frontier is a category of imagined landscape – and perhaps the original imagined landscape - which has long been central to American history. Over the course of US history, many actual geographies have taken on this role: the 13 original colonies, the West out beyond the Mississippi river, the Southwest, and eventually, California. The Frontier is a place that promises total freedom – from government, from social norms, from convention, from technology and industry, and ultimately from other human beings. In place of these things it promises self-reliance, self-actualization, a profound spiritual experience with untainted Nature, and, ultimately, a sense of Meaning. The Frontier is fundamentally, by its nature, an imagined landscape – once you actually reach a Frontier, it has now been tainted by human presence, and there is nothing for it but to keep moving West. In this chapter, I argue that in the late 60s and early 70s, outer space often took on the role of the Frontier for American mainstream and counterculture alike – and that it provided a compelling narrative at the heart of L-5’s imagined colonial project.

The history of American thinking about the Frontier was first laid out by Fredrick Turner in his 1893 essay, “The Significance of the Frontier in American History.”⁶³ Since Turner, there has been a great deal of scholarship expanding upon or disputing his analysis of the role of the Frontier in American history, but Turner’s description of the Frontier as an aesthetic, and why it is so desirable to Americans, has been so influential in casual American thought about the Frontier and the West that I will use his language to take you on an initial tour of the Frontier Myth.⁶⁴ Turner lays out the Frontier not as a specific place, but as a sort of role that a landscape

63 Fredrick Jackson Turner. “The Significance of the Frontier in American History,” in *The Frontier In American History*, (Tucson: University of Arizona Press, 1986).

64 To name a few: William Coleman, “Science and Symbol in the Turner Frontier Hypothesis” in *The American Historical Review*, Vol. 72, No. 1 (Oct., 1966), pp. 22-49, Richard Hofstadter, “Turner and the Frontier Myth,” *The American Scholar*, Vol. 18, No. 4 (AUTUMN 1949), pp. 433-443, William Cronon, “Revisiting the vanishing frontier: The legacy of Frederick Jackson Turner,” *The Western Historical Quarterly*, 18.2 (1987): 157-176, and John Mack Faragher, “The frontier trail: Rethinking Turner and reimagining the American West.”

can take on. The Frontier is what lurks just beyond the border of civilization – far enough away that it is unfamiliar, but close enough that it is potentially knowable.⁶⁵ The Frontier is also a landscape that bears certain promises. It is a place where settlers can start from a complete *tabula rasa*, free from existing social norms and institutions: “For a moment at the Frontier, the bonds of custom are broken...an escape from the bondage of the past....and the scorn of an older society.”⁶⁶ Not only are settlers of the Frontier free from pre-existing laws and structures, but the Frontier itself makes them want to embrace that freedom. “the Frontier is productive of Individualism...it produces antipathy to control and particularly any direct control,” writes Turner. He goes on to suggest that the mere nature of the Frontier inspires pioneers to reject the restrictions of government: “the tax gatherer is viewed as a representative of oppression.”⁶⁷ The Frontier is a landscape which promises infinite resources, space to expand into – space for “evolution,” and “Progress.”⁶⁸ The Frontier promises property, and the opportunity for advancement and prosperity, to anyone who is willing to work for it.⁶⁹ And, by forcing them to work to earn their keep, the Frontier gives the colonist’s life a sense of meaning, since they live it with the knowledge that everything they own was the honest product of their own two hands. Finally, the Frontier promises a space untouched by the technology and industry of the old world. It is a place where one can still have a profound and transformative experience with Nature in its pure form. “The wilderness masters the colonist,” writes Turner “the Frontier environment is at first too strong for the colonist....the stubborn American environment is there with its imperious summons to accept its conditions.”⁷⁰ The Frontier is not just a place, but a landscape that promises a way of life – just encountering the geography of it will transform you into a freer person.

Turner also argues that landscapes that take on the role of the Frontier tend to behave in certain ways – in particular, the Frontier is a role that is constantly handed off between landscapes as yesterday’s Frontier becomes tomorrow’s mundane. Turner writes:

(1993): 106-117.

65 David Valentine, Valerie A. Olson, and Debhora Battaglia, “Extreme: Limits and Horizons in the Once and Future Cosmos,” in *Anthropological Quarterly*, Volume 85, Number 4, Fall 2012, pp. 1007-1026.

66 Turner, “The Significance of the Frontier.”

67 Ibid.

68 Ibid.

69 Ibid.

70 Ibid.

“We have...a recurrence of the process of evolution in each western area reached in the process of expansion...American development has exhibited not merely advance along a single line, but a return to primitive conditions on a continually advancing frontier line, and a new development for that area.”⁷¹

There is a bit of a paradox to the Frontier: The Frontier is somewhere we can go to get away from civilization, but if we go there we bring a little bit of civilization with us in settling it, and the Frontier eventually becomes indistinguishable from the civilization we left. If someone is invested in the idea of a Frontier existing, they must keep chasing it, finding new landscapes to take up the role of the new Frontier. For most of American history, this has been a process of moving the Frontier line West. For instance, in the days of the early United States, the Louisiana purchase territories were seen as the Frontier, but by the mid 19th century, they had been relatively settled and industrialized by Europeans, and the role was handed off to the territories that would become the southwestern states. As Turner argues, for most of American history, America has been a nation in the strange position of having a huge expanse of land to the West to expand into (or perhaps, the strange psychological position of believing that all of the land to the west is “free land,” available to be colonized, due to a failure to acknowledge Native American property rights to the land) - “the existence of an area of free land...and the advancement of American settlement westward,” Turner writes, “explain American development.”⁷² Because of this, Americans are perhaps more invested in the idea of the Frontier than people in other countries – because for so much of American history, a new Frontier was so easy to find. Turner argues that the Frontier explains everything in American politics – that all American values obviously stem from the easy availability of westward land. At the time that Turner was writing, many Americans felt that they were in a state of crisis because that possibility of endless western expansion was coming to an end – by the start of the 20th century, American cities and railroads spanned from sea to shining sea, and there was no more West to run to – what Turner and his contemporaries called the “closing of the Frontier.”⁷³ Since that point, Americans have often tried

71 Turner, “The Significance of the Frontier in American History.”

72 Ibid.

73 Cronon, “Revisiting the vanishing frontier.”

to find Frontier substitutes, often ones less obvious than the West. For one thing, the ghost of the Frontier still haunts the West, allowing it to play that role in part – even though the West is not somewhere you can move to literally build a homestead from the ground up and raise your own cattle three hundred miles from any other humans, we still do think of California as a place you go to get away from the stuffy ways of the east coast and realize your individualist dreams. But another strategy has been to find other, more distant or more metaphorical landscapes to play the Frontier – for instance, outer space, or cyberspace.⁷⁴

In modern debates about the Frontier, various claims that Turner makes about the importance of the Frontier to American history have come under scrutiny. The Frontier, some historians such as Ralph Mann and Howard Lamar have argued, has never really existed – the free land to the west has often been more inhabited, or required more government intervention to “open up” than Frontier enthusiasts often like to acknowledge.⁷⁵ Faragher and Cronon have also criticized Turner’s argument that the existence of the Frontier was actually essential in shaping or is necessary for American Democracy – especially because this argument has clearly historically been used as a justification for colonial expansion in order to “protect the American way of life.”⁷⁶ But what most modern scholars in the Frontier debate to agree on is that the Frontier, whether or not it has ever been an actual place that has shaped American life, is an important dreamscape that has shaped the American *ideal* and aspirations of Jeffersonian Democracy and the Yeoman Farmer.⁷⁷ Whether justified or not, Americans like the idea of the Frontier, and get uncomfortable when they feel like there is no new landscape that can take on that role. The Frontier Myth is a powerful master narrative which has shaped most sociotechnical imaginaries in American history, from the Wild West to the Cyberpunk World Wide Web – and, of course the Apollo Era conception of Outer Space.

74 Geppert, “the post-Apollo paradox,” Cronon, “Revisiting the vanishing frontier,” David A. Mindell, *Digital Apollo: Human and Machine in Spaceflight*, (Cambridge, Mass; London : MIT Press, 2011), and John Perry Barlow, “A Declaration of the Independence of Cyberspace,” *Electronic Frontier Foundation*, 1996, <https://www.eff.org/cyberspace-independence>, Last Accessed 5/9/2019.

75 Ralph Mann, “Frontier Opportunity and the New Social History,” *Pacific Historical Review*, 53 (November 1984), and Howard R. Lamar, “Persistent Frontier: The West in the Twentieth Century,” *Western Historical Quarterly*, 4 (January 1973).

76 Cronon, “Revisiting the vanishing frontier” and Faragher, “Rethinking the frontier trail.”

77 Hofstadter, “The Frontier Myth” and Cronon, “Revisiting the vanishing frontier.”

In the 1970s, like every other decade of American history, the idea of the Frontier was central to debates about American politics and culture, on both sides of the aisle. It comes as no surprise that the idea of the Frontier was deeply appealing to the new libertarians of the post-war period. For libertarians, the Frontier represented life with less government intrusion, no taxes or major infrastructure interventions, no overly restrictive moralizing laws. It also represented the virtue of total self-reliance: an environment in which you owed nothing to anyone, nor them to you, and were entirely responsible for your own happiness and survival. Western and southwestern libertarians were aesthetically at home in the popular images of the Frontier: wild western cowboy life, rolling red hills, and the stars at night shining bright deep in the heart of Texas. But, despite the cultural disjunction, many hippies and members of the more leftist counterculture were also drawn to the idea of the Frontier and the West, as Michael Allen describes extensively in his essay on hippies and cowboy aesthetics.⁷⁸ Allen documents a song, “The Hippie and The Cowboy,” written by country singer Chris Ledoux in 1981, which recounts a dramatized account of a hippie and a cowboy meeting by chance. After a dispute, mainly over cultural differences and tribal markers, the hippie argues that the two of them are really the same:

“Said now me I got my things and you you got yours
And I don't see why we can't get along
They say the closest thing to freedom is livin' on the road
In a country where freedom's almost gone”⁷⁹

The Cowboy and The Hippie was written by a country singer and acknowledges this similarity from the cowboy side, but numerous positive depictions of cowboy culture in hippie songs (most notably, The Nitty Gritty Dirt Band’s “Cosmic Cowboy”), and hippie artists influenced by country music and frontier imagery (For instance, The Byrd’s “Chestnut Mare”), make it clear that this sense of occasional admiration and kinship could go both ways.⁸⁰ Many hippies, similar to libertarians, also had a relationship with The West as a sort of promised land. Whether they

78 Michael Allen, ““I Just Want to Be a Cosmic Cowboy”: Hippies, Cowboy Code, and the Culture of a Counterculture,” *Western Historical Quarterly*, Vol. 36, No. 3 (Autumn, 2005), pp. 275-299.

79 Chris Ledoux, “The Cowboy and the Hippie,” track #8 on *He Rides The Wild Horses*, 1981.

80 Allen, “Cosmic Cowboy.”

had moved out to Arizona in search of open space and an opportunity to rough it out on their own ranch, or San Francisco in order to find the meaning of life and start a band, both groups regarded The West as a sort of paradise, a land of total freedom where one goes to find themselves, and to make a name for themselves – and perhaps both groups experienced the same disappointments when The West failed to live up to their expectations.⁸¹

As frontiers increasingly closed up in the 20th century (as Chris Ledoux puts it, “in a country where the freedom’s almost gone”), space colonization provided a natural successor.⁸² By the 1970s, and by all accounts, much earlier, it was generally believe that most true “frontiers” had vanished from the US. Thomas Heppenheimer, a member of the L-5 Society wrote, “On Earth, it is difficult for...people to form new nations or regions for themselves” – on Earth, there were practically no places that someone could go to get a patch of land for themselves, to start something totally new, to explore something that had never been explored, the perception went. But outer space provided infinite room to do so.⁸³ This vision is perhaps nowhere as obvious as Gene Roddenberry’s branding of space, in the opening monologue of Star Trek, as the “Final Frontier.” This sort of frontier language was mirrored throughout the entire American space program, from Kennedy’s rhetoric about the Apollo program and manifest destiny to NASA’s naming of spacecraft like “Pioneer.”⁸⁴ Even O’Neill employed it in the naming of his treatise on space habitats, *The High Frontier*.⁸⁵ Explicit analogies between space and the West were often employed by NASA, and other commentators at the time. “Space,” said NASA director Tom Paine⁸⁶ in a speech shortly after the moon landing, projecting futures for life on the High Frontier, “will be like Phoenix, Arizona.” The mass media frequently drew comparisons between astronauts and “cowboys.”⁸⁷ The analogy between space and the Frontier was certainly not lost on critics, especially Native American critics, who denounced the space program as “colonialist” and “imperialist.” A group of Native American scholars meeting in 1970 to discuss

81 McCray, *The Visioneers*.

82 Ledoux, “The Cowboy and the Hippie.”

83 Thomas Heppenheimer, “A Strollin’ In the Astroturf,” *L-5 News*, May 1976.

84 Geppert, “The post-Apollo paradox,” and Matthew Hersch, *Inventing the American Astronaut*, (New York: Palgrave Macmillan, 2012).

85 O’Neill, *The High Frontier*.

86 Matthew Tribbe, *No Requiem For the Space Age: The Apollo Moon Landings and American Culture*, (Oxford: New York; Oxford University Press, 2014). The director of NASA in the 60s and 70s aptly shared a name with Thomas Paine, author of *Common Sense*.

87 Tom Wolfe, *The Right Stuff*, (New York: Picador, 1978), and Hersch, *Inventing the American Astronaut*.

the moon landing published the statement “pity the Indians and buffalo of outer space.”⁸⁸ Even 1970s sci-fi novels, including LeGuin’s *The Dispossessed* and Heinlein’s *The Moon Is A Harsh Mistress*, bore out this analogy depicting individualistic (sometimes anarchistic) settlements in space, often located in desert landscapes which evoke the dusty red mountains of the southwest.⁸⁹ The idea of creating a free, radically different, and perhaps utopian community in space is not a new one. As early as the 1890s, science fiction authors were using Mars and the Moon as settings for utopian political novels – for instance, Alexander Bogdanov’s *Red Star*.⁹⁰ But in the Apollo Era, with the rise of the American space program, space in the American consciousness was starting to take on the flavor of a particularly American Frontier.

If the language of the Frontier to describe space was prevalent in the general culture, it was used in practically every breath by the L-5 Society. “I absolutely want to go to space,” said Carolyn Henson in an interview, “I wanted to live there and grow food. I wanted to be a pioneer, in the classic spirit.”⁹¹ For starters, many members of the L-5 Society themselves hailed from the West. The Hensons themselves lived in a semi-agricultural, semi-suburban ranch house out in the desert in Arizona, and the L-5 Society was mostly concentrated in California, Nevada, and Arizona.⁹² The L-5 Society’s designs often reflected these western aesthetics too – The official illustrations of his space habitats that O’Neill commissioned were often said to look Californian, and other writings and designs by the L-5 Society made reference to western landscapes, starry skies comparable to desert vistas, and even long horned cattle and square dances.

But even beyond the organization’s actual settling, the idea of the Frontier also colored every aspect of the imagined space colony which the L-5 Society constructed. The words “frontier,” “pioneer,” “homestead,” and “wilderness,” commonly associated with the old wild west and the frontier lifestyle, are found in almost every L-5 publication. In one, Thomas Heppenheimer imagines a space colonization program explicitly determined “to colonize space

88 M. Jane Young, ““Pity the Indians of Outer Space”: Native American Views of the Space Program,” in *Western Folklore*, Vol. 46, No. 4 (Oct., 1987), pp. 269-279.

89 Ursula K. LeGuin, *The Dispossessed*, (Harper and Row: 1974), and Robert Heinlein, *The Moon Is A Harsh Mistress*, (J. P. Putnam and Sons: 1966). And of course, space as the science-fictional West is perhaps made clearer nowhere better than H. Beam Piper’s 1958 novel, *A Planet for Texans*.

90 Michael G. Smith, *Rockets and Revolution: A Cultural History of Early Spaceflight*, (Lincoln : University of Nebraska Press, 2014).

91 Regis, *Great Mambo Chicken*.

92 McCray, *The Visioneers*, and Westwick, “From the Club of Rome to Star Wars.”

following the historical precedents of colonization in America, and of settlement in the West.”⁹³ Members of the L-5 Society also often compared their efforts at space colonization to the Frontier of the original 13 American colonies. “We’re celebrating a bicentennial,” said Ben Bova, an L-5 adjacent space enthusiast, in a talk at a conference in 1976, “and what we are really celebrating is the recognition of the fact that we rewrote the rulebook on how to live. We started a new kind of society in a new frontier....this same thing will happen in space.”⁹⁴ At the same conference, Isaac Asimov referred to space travel as “declaring independence, not only of the Earth, but the solar system as well,” and compared the first steps in creating space colonies to “Columbus’s voyage.”⁹⁵ The frontiersman image of manifest destiny⁹⁶, an almost moral imperative to explore, and expand to fill frontiers, is also prominent in L-5 rhetoric. “If we take the attitude that our task is simply to make the Earth more livable, we have not only made a cradle out of the earth, but a prison as well...Would it have been enough to have become a hunter but never to have become a farmer? Would it have been enough to become a farmer and never to have become an industrialist?...if we don’t go out into space, we have stopped advancing” writes Asimov.⁹⁷ In fact, the analogy between space and the Frontier of the American West was so strong that members of L-5 often imagined the actual geography of life in space as resembling the West. The illustrations O’Neill commissioned of his designs depict rolling hills and fields, not unlike the geography of California...even down to the Bay Bridge.⁹⁸ Imagining life on L-5, James and Ronald Drummond wrote to *L-5 News* “every month [colonists] could take a few days off to visit their closest neighbors and attend an all orbit round dance...they could have a good time in the best traditions of the Old West.”⁹⁹ Even the L-5 Society’s unofficial anthem, “Home, Home on Lagrange,” a play on “Home on the Range,” implicitly places L-5 in the position of the Frontier.¹⁰⁰

In the next few chapters of this essay, I will examine the nuances and complications of how space played the role of the Frontier for the L-5 Society – and, if we see the L-5 Society as

93 Thomas Heppenheimer, “Home, Home, on Lagrange,” *L-5 News*, August 1976.

94 Ben Bova, *Chrysalis*.

95 Isaac Asimov, *Chrysalis*.

96 Manifestiny

97 Asimov, *Chrysalis*.

98 Geppert, “the post-Apollo paradox.”

99 Ronald Drummond, “Another Road to Colonizing Space,” *L-5 News*, Aug 1976.

100 Heppenheimer, “Home, Home on Lagrange,” and *Home on Lagrange*, NESFA Filk Hymnal.

one of the most extreme examples of a societal trend towards understanding space as a Frontier, 1970s society in general. Each of the following three chapters is devoted to exploring a particular role of Turner's Frontier that members of the L-5 Society expected space to play – freedom from existing institutions and social conventions, the promise of real wealth in exchange for meaningful honest labor, and an encounter with the sublime in untainted Nature. In each, I will explore how 1970s imaginings and realities of space both succeeded and failed to live up to the would-be-colonists' expectations. I argue that the first few years of the L-5 Society's history, from 1975 to 1977, can be seen as a sort of thought experiment in space colonization. O'Neill's visions for a L-5 space station may never have actually been realized. But simply through the process of planning out and worldbuilding a space colony in great detail, members of the L-5 Society, on a somewhat accelerated timescale, ran into many of the fundamental struggles between individualism and society which colonists of actual frontiers encounter, as the landscape of L-5 imagined by colonists became tamed, industrialized, and, to some degree, suburbanized. Thus, we can treat the publications and conversations in the L-5 Society almost as a model history of an actual space colony, from an untamed wilderness to the closing of the High Frontier.

“I don't want to, it's so nice out here”: The Lawless Frontier of Deep Space

One of the main draws of space as a Frontier in the Apollo era was the idea of space as completely free – unconstrained by resources or any sort of limit to growth and untainted by any previous infrastructure or societies which could leave hard-to-shake traditions. If life on earth was defined by a discontentment with untrustworthy and overbearing organizations, shambling bureaucracies, and outdated social conventions, then space represented a place where none of those institutions had a foothold. Many members of L-5 were interested in space as a location which was inherently free and lawless, a location whose mere geography made laws and social ties impossible. Members of the L-5 Society were excited to set up in space, “off the grid,” and to live totally self-sufficiently, owing nothing to any man. However, the proposed L-5

development was in reality far from without bureaucratic, institutional, and government involvement, and, as it soon became clear to members of the society, their libertarian-utopian paradise would never be able to become a reality without a massive, government-funded public works project.

Even down to the mere physical reality of its geography and physics, space appealed to the freedom-loving individualists of L-5. The physics of space was one of independence, unthetheredness. The imagery of objects floating, completely unattached to each other, in Zero-G was powerfully compelling to many individualist space enthusiasts who reprinted endless pictures of weightless, tetherless life in *L-5 News*, and other publications.¹⁰¹ Isaac Asimov, the prominent sci-fi author, who occasionally wrote the *L-5 News* and adjacent publications, speculated about wondrous “human powered flying machines” in low gravity areas of the space station, allowing colonists to literally soar under their own power.¹⁰² And Robert Frietag, another contributor to the newsletter, was so taken with the idea of space as free-floating and devoid of all constraints or ties that he insisted “we could be talking over wristwatch radios [on L5] instead of using the wires we’re all wired together with on this planet.”¹⁰³

Some members of the L-5 Society also believed that space’s geography kept it inherently lawless, like the wild west, in a permanent state of anti-authoritarianism – as Turner would say, space was an environment which “produces antipathy to control.”¹⁰⁴ Ben Bova wrote “When Russians orbited Sputnik back in 1957, they did so without asking permission to overfly any nation on Earth...the simple fact was that there were no consequences. There was no way a nation could stop or shoot down a satellite in 1957.”¹⁰⁵ He also describes Ed White’s space walk in similar terms “after his five minutes were over, ground control in Houston said ‘Alright Ed, it’s time for you to come back in.’ and Ed said ‘I don’t want to. It’s so nice out here, it’s so wonderful.’ And he stayed out for another 8 to 10 minutes...there was no way for Houston to make him go back into the spacecraft.” “Just as the discovery of the new world eventually led to the American revolution,” Bova adds, an encounter with space made Ed White shake off the

101 Asimov, *Chysalis*.

102 Ibid.

103 Robert Frietag, “Space Industrialization: Captain Frietag of NASA,” *L-5 News*, March, 1976.

104 Turner, “The Significance of the Frontier.”

105 Bova, *Chysalis*.

bureaucratic shackles of the space program.¹⁰⁶ In Bova's account, there is a suggestion that not only is space a place where residents have freedom from earthly laws, which cannot be enforced on them, but that there is actually a psychological effect to space which makes people realize and exercise their own inherent freedoms. For Bova, and many others, this meant that it didn't really matter who colonized space (the military, the private sector, or the Russians), because, due to fundamental aspects of the human psyche and the geography of space, once anyone got there space would open up the same possibilities for freedom and the creation of new free societies. As O'Neill elegantly put it "Space can be regarded as a culture medium...rich in matter and energy and ripe for exponential growth."¹⁰⁷

Space's promise of total physical and legal freedom was often seen by the L-5 Society as a promise of total social freedom too. "On Earth, it is difficult for...people to form new nations or regions for themselves," Thomas Heppenheimer wrote to *L-5 News*, "but in space it will be easy...those who wish to found experimental communities, to try new social forms and practices, will have the opportunity to strike out into the wilderness and establish their ideal."¹⁰⁸ Carolyn Henson seconded this, writing "[space] would be an unparalleled chance for humanity to break away from the authoritarian political structures of planet earth. The habitats represented freedom, autonomy and escape from...bureaucracy."¹⁰⁹ Writing for *L-5 News*, Timothy Leary took this claim to an extreme "literally each group of colonists who band together and finance and design a space habitat will be in the position of creating a new consensus reality...colonists can determine the political, cultural, and aesthetic dimensions of the psyche-space they inhabit."¹¹⁰ As Leary's statement also suggests, belief in the infinite resources of space helped convince disparate groups joined together by the joint goal of individualism that their desires were not at odds with each other, because of the limitlessness of space. "Each physically separate community....can have a completely different type of climate, weather, and landscape" promises the L-5's official statement to the Habitat Conference, "as well as totally distinct cultures,

106 Ibid.

107 McCray, *The Visioneers*.

108 Heppenheimer, "A Strollin' in the Astroturf."

109 Regis, *Great Mambo Chicken*.

110 Timothy Leary, "Dr. Leary on Snake Oil, Liberals, and Amino-Uganda," *L-5 News*, Aug 1976.

languages, lifestyles...”¹¹¹ The L-5 Society believed space to be a total *tabula rasa* – a place where anyone could start anew and build whatever community they wanted.

Publications by the L-5 Society often stress that space should be totally open to any sort of individualist interested in starting their own society – the official L-5 statement on space in their charter was that space should be equally accessible to people of any gender, race or creed, and, in a work of sci-fi writing on a future space colony, Heppenheimer assured that “Affirmative Action hiring procedures [would be in] full force.”¹¹² The L-5 Society sometimes even criticized NASA for not promoting diversity enough. In a criticism of Tom Paine, Timothy Leary wrote to *L-5 News* that Paine’s statements on who could be a NASA astronaut “manage[d] to alienate all tax-payers who are female, non-engineers, non-protestants, and prefer non-marine hair styles.”¹¹³ The actual composition of the L-5 Society did not necessarily reflect this promise. Its membership was overwhelmingly white and male.¹¹⁴ And, despite the theoretical possibility of a space colony for any sort of governmental structure or lifestyle you could dream of, the actual fleshed out visions of space colonization presented by L-5 often fit a fairly narrow description of a libertarian-anarchist leaning farming community, slightly to the left of normative middle-class values. But it is important to note that members of the L-5 Society, at least in print, very seriously believed in advertising their vision as adaptable and open to all. Members of the L-5 Society, when they did on occasion encounter people outside of the society who did not fit the typical L-5 mold of a middle class, white, libertarian, were often somewhat disappointed that their vision was not actually perceived as as welcoming as they had thought. Norrie Huddle, a vocal advocate of L-5 who attended the UN Habitat conference, wrote:

‘A thing that bothered me was that although our booth was getting a lot of attention, it was primarily visited by Canadians and U.S. citizens. I asked a few third-world people, with whom I had become friendly, their impressions of our literature. The response was not unpredictable: “It sounds like you’re supporting another U.S. attempt to control the third world by advocating

111 Norrie Huddle, “Habitat UN Conference on Human Settlements,” *L-5 News*, July 1976.

112 Heppenheimer, “Home, Home on Lagrange.”

113 Leary, “Dr. Leary on Snake Oil.”

114 McCray, *The Visioneers*.

space development.” They assumed we were merely advocating space development and in no way picked up on how it was relevant to them.”¹¹⁵ However, despite the fact that there is little evidence of serious L-5 outreach to people of diverse backgrounds or opinions, or that this outreach worked if it existed, most L-5 members did continue to describe “diversity” as a goal of their organization – and L-5’s actual lack of social or political diversity did not seem to get in the way of their impression that space was a place that supported difference and experimentation. The vision of space as a place where norms did not exist, where anyone was free to “do their own thing,” remained central to the way that L-5 members talked about space, and what most members would claim was one of the most exciting prospects of space colonization.

However, members of the L-5 Society also acknowledged that space colonization would not be possible without massive government assistance. Though some die-hard countercultural and libertarian space enthusiasts liked to insist that they could colonize space with rockets made by their own two hands, the L-5 Society quickly realized that the US government was pretty much the only organization capable of organizing (and fronting the money for) a project of the required magnitude.¹¹⁶ Looking back on the DIY counterculture of the 70s, Stewart Brand said, in an interview with the *New Yorker*, “The New Earth Catalog was very libertarian, but that’s because it was about people in their 20s, and everybody was reading Heinlein and asserting themselves and all that stuff...we didn’t know what the government did. The whole government apparatus is quite wonderful and crucial...most of the real engineering was done by people with narrow ties who worked 9 to 5, often with federal money.”¹¹⁷ Even at the time the first issue of *L-5 News* was published, the Henson’s main plan was to support O’Neill in lobbying congress to build the space station for them, and over time more and more parts of L-5 began to rely on government infrastructure – colonists could be trained by NASA and could be transported up and down from the station by shuttles on their way to the I.S.S.¹¹⁸ Ultimately, they even had to admit that the totally wireless, untethered system of solar power transfer would be ensnared by the tendrils of infrastructure – there would need to be some sort of government body to standardize

115 Huddle, “UN Habitat Conference.”

116 McCray, “Timothy Leary’s Transhumanist SMI2LE.”

117 Anna Weiner, “The Complicated Legacy of Stewart Brand’s “Whole Earth Catalog”, *The New Yorker*, Nov 16, 2018, <https://www.newyorker.com/news/letter-from-silicon-valley/the-complicated-legacy-of-stewart-brands-whole-earth-catalog>, last accessed 1/15/2019.

118 *L-5 News*, September 1975, and Heppenheimer, “Home, Home on Lagrange.”

radio frequencies, and coordinate between the L-5 solar power farmers and microwave astronomers down on earth.¹¹⁹ Besides, there were¹²⁰ concerns about the test microwave transmission towers frying geese and other birds who got too close...a cosmic scale repeat, perhaps, of the Henson's tesla coil interference and unruly goats.

In many ways, the L-5 Society's experience with the inherent freedom of space encountering the reality of government control mirrored struggles within the space program over the image of an astronaut as an agent and American hero, but also as a highly constrained piece in a large bureaucratic and technical system that made piloted space flight possible. In mass media depictions, the Apollo astronauts were usually presented as the real heroes of the space program – the brave souls who piloted the spacecraft to the moon and back, though their own skill and daring do.¹²¹ Especially in contrast to the Soviet space program and the threat of communist conformity, astronauts were supposed to be red blooded, all American, individualistic heroes – pioneers and cowboys. Stories like Ed White's rebellious space walk stand out as testaments to the incredibly agency of these powerful individuals.

But, historians of technology including Matthew Hersch and David Mindell, have argued that in reality astronauts were really little more than the human payload for rockets which only flew because of an intensely bureaucratic system.¹²² In fact, our understanding of astronauts as individual heroes was partially due to a deliberate act of rebranding by NASA – for instance, changing the name of “capsules” to “spacecraft” in the Mercury program because the word “capsule” did not suggest a sense of agency or being “piloted.”¹²³ And these publicity campaigns did not even convince everyone. Many Americans immediately following the moon landing commented on how little personality the individual astronauts seemed to have. They were practically a set of identical, crew-cut wearing men in government uniforms.¹²⁴ In *No Requiem for the Space Age*, Matthew Tribbe argues that Neil Armstrong, despite now being hailed as the individualist man who took the small step which was a giant leap for mankind, was seen as so

119 Heppenheimer, “What are the Libration Points?”.

120 Ultimately unfounded

121 Wolfe, *The Right Stuff*, Tribbe, *No Requiem For the Space Age*, and Mindell, *Digital Apollo*.

122 Hersch, *Inventing the American Astronaut*, and Mindell, *Digital Apollo*.

123 Hersch, *Inventing the American Astronaut*, 132.

124 Tribbe, *No Requiem for the Space Age*.

generic in the 1960s that the majority of Americans could not even remember his name by 1971.¹²⁵

Astronauts themselves often chafed against their lack of agency in piloting spacecraft, which were mostly flown by mission control through “fly by wire” navigation systems.¹²⁶ David Mindell (*Digital Apollo*) argues that Apollo astronauts tried to assert a little human agency by overriding the autopilot navigating computer to land on the moon – despite the fact that the computer in almost every case had the calculations right. And early astronauts strongly objected to having to be rescued “like a bag of kittens” from drowning in the capsule after it plopped down in the ocean, which provided one of the main motivations for the adoption of the space shuttle, which could be landed by a pilot.¹²⁷ But ultimately, these were token acts of rebellion, astronauts attempting to flex a little in a technological system that gave them about as much room to stretch their arms as a soyuz capsule. In a significantly less triumphant re-enactment of Ed White’s rebellion on the first spacewalk, the three astronauts of the fourth Skylab mission committed a small mutiny: they refused to take prescribed anti-nausea medication before the flight because they worried that it would make them too dizzy to fly well, and did not trust the medical authorities to properly assess the conditions they needed to perform their job.¹²⁸ The flight started with one of the astronauts, Bill Pogue, losing his lunch, and the rest trying to hastily cover it up, while the on-board radio picked up their deliberations and ratted them out to mission control – a scene which, in contrast to the L-5 Society’s perception of Ed White’s total ontological freedom, demonstrates the systems of biopower and technological control that most astronauts were constrained by at every turn. Thus, it may come as little surprise, that the would-be colonists of L-5 also found themselves running into government control where they had expected to find the total liberty of outer space.

For some members of L-5, the inevitability of government intrusion in their space colony wasn’t a problem. When it came down to it, the L-5 Society was comfortable as a lobbying group, trying to get the government to spend billions of dollars on an infrastructure project. Members of the society were, or became, comfortable using the language of lobbyists and policy

125 Ibid.

126 Hersch, *Inventing the American Astronaut*, 4.

127 Mindell, *Digital Apollo*.

128 Hersch, *Inventing the American Astronaut*, 113.

makers – for instance, Asimov writing “that 500 billion dollars doesn’t...get torn up and thrown into space; it is spent right here on Earth and makes itself seen in the form of jobs,” or the repeated talking point in *L-5 News* that an L-5 station would still be cheaper than the trans-Alaska pipeline.¹²⁹ Some members of L-5 Society even explicitly argued that they saw no contradictions between a libertarian ideology and government spending to unlock frontiers. Mark Hopkins, for instance, wrote in a letter to *L-5 News* “From the earliest days of our nationhood, the government has participated in one form or another of investments canals, turnpikes, and later, railroads [sic.]...this was because they had a frontier to open up. Today, we see before us another frontier, the high frontier, whose economic potential may dwarf the frontier which lay to the west of the original 13 states.”¹³⁰ Even if this meant compromising on their original individualist utopian ideals, that was alright by some L-5 Society members, since living in space was framed as the highest goal. Echoing the struggles of the faceless, crew-cut astronauts, one commenter to *L-5 News* put it bluntly “I don’t care if I have to cut my hair and play space marines for Uncle Sam, so long as it’s what gets my boots on the moon.”¹³¹ For others, it was an issue. Timothy Leary wrote, in response to one such proposal that he didn’t want space migration to be “another Alaska pipeline adventure controlled by the oil politicians, the lunar Mafia and the Inter Planetary Teamster’s Union.”¹³²

In American history, government infrastructure has actually frequently been required to “open up” frontiers. The Southwest, a the part of the United States that identifies most strongly with the vision of the Frontier, and the heavily libertarian area where the Hensons lived, is also home to some of the US government’s biggest public works projects: aqueducts to irrigate sections of desert, highways to make transportation possible across the vast stretches of free open space, and so on.¹³³ Arizona politicians, including Udall and Goldwater, who both endorsed the L-5 Society, served their constituents by fighting in congress for public works projects like these – but would also never get re-elected if they’d publicly admit to pushing for big government. The L-5 Society’s relationship with the government is much like the southwest’s relationship with the government, only played out on the High Frontier. In some ways, many of the other ideological

129 Asimov, *Chrystalis* and *L-5 News*, November 1975, and March 1976.

130 Mark Hopkins, “Recent Developments in the Economics of Power from Space,” *L-5 News*, October 1976.

131 McCray, *The Visioneers*.

132 Leary, “Dr. Leary on Snake Oil.”

133 Personal conversation with William Deringer, February, 2019.

conflicts or contradictions within L-5 can be seen as specific extensions of the same dilemma – that being more self-sufficient or free in one respect often involves being more dependent on other humans or constrained in another. Few frontiers are opened up without infrastructure, be it the technology to get there, the industrial systems to make it accessible and profitable – As David Valentine, Valerie A. Olson, Debhora Battaglia argue in “Extreme: Limits and Horizons in the Once and Future Cosmos,” humans rely on technological systems to survive in pretty much any new environment they encounter, and these technological systems come with organizations.¹³⁴ As with many Frontiers, escaping earth did not necessarily mean escaping the pull Earth’s governmental and social systems. You can’t lift yourself out of a gravity well by your own bootstraps.

‘Just McDonalds in Space’: Consumerism and the DIY ethos

Another major aspect of the Frontier myth is that the Frontier is somewhere a person could go to get away from industrialization, city living, organized capitalism, and, increasingly the criticism went in 70s version of the myth, from consumerism. Especially since the rise of the suburbs, soulless consumerism – working meaningless nine-to-five jobs in order to buy mass produced garbage that you don’t need – was seen as one of the main ways that 70s society had betrayed the ideals of the Frontier – working hard at meaningful tasks in order to live honestly by the direct product of your own labor. Members of the 70s counterculture, and hence many members of the L-5 Society, criticized the suburbs in particular as an emblem of this way of life which was antithetical to the Frontier. They initially imagined L-5 as a sort of anti-suburb Frontier landscape, a rugged mining colony. However, as the L-5 Society’s sociotechnical imaginary evolved over the course of their first few years, and members of the L-5 Society began to close in on planning what they’d like their day-to-day life in space to be like, as well as the problem of advertising L-5 to others, the landscape of L-5 changed. In later writings, and in the visuals that the L-5 Society used to advertise its colony to others, the dreamscape of L-5 became less rough and rugged, and more manicured and polished – in short, it was suburbanized.

¹³⁴ Valentine et. al., “Extreme.”

One of the major criticism of the suburbs floating around the pop-culture (and occasionally making its way into the mainstream) in the 1970s, can be more aptly described as a broader criticism of consumer capitalism, which seized upon suburbia as an example of everything wrong with mainstream American consumer culture. The suburbs, the criticism went, were a center of soulless consumerism, a way of living where, starting with their pre-packaged Levittown house, Americans bought object after object that they believed would make them happy, seeking out fulfillment in hollow materialism.¹³⁵ They no longer needed to know how to build a house, cook their own meals, perform their own household labor – instead, they could purchase pre-made items, or devices which would do the work for them.¹³⁶ Many critics decried this sort of consumerism as a loss of good old American DIY know how – this was certainly the view of Steward Brand and his *Whole Earth Catalog* Crew. Americans, according to these authors were getting cushy, soft, complacent, and dependent upon material goods.¹³⁷ The suburbs were also hated as a symbol of a sort of consumer culture which turned everything (a home, a happy family, social status, identity) into something that could be bought. The suburbs were much more heavily planned than rural or urban living arrangements (having been created all at once, as mass housing developments, by real-estate developers, rather than by the gradual, organic process of human habitation over long timescales).¹³⁸ Whereas previously Americans could buy a *house*, the suburbs promised to sell them a *neighborhood* – consumerism even eliminating the need to go out and build one’s own community. Other critics extended this argument even further, blaming consumerism for the hollow inanity of suburban life. This link between consumerism and fundamental dissatisfaction is the criticism at the heart of most of the great anti-suburban works of the 50s through 70s, from *The Levittowners* to *The Man in the Gray Flannel Suit*.¹³⁹ As technology historian David Kaiser summarizes the criticism in his essay

135 Elizabeth Cohen, *A Consumer’s Republic: The Politics of Mass Consumption in Post-War America*, (New York Knopf: Distributed by Random House, 2003), David Kaiser, “The Post-War Suburbanization of American Physics,” in *American Quarterly* 56, 2004, 851–888, and Kenneth Jackson, *The Crabgrass Frontier: The Suburbanization of The United States*, (New York : Oxford University Press, 1985).

136 Cohen, *Consumers Republic*.

137 McCray, *The Visioneers*, Fred Turner, *From counterculture to cyberculture: Stewart Brand, the Whole Earth Network, and the rise of digital utopianism*. (Chicago: University of Chicago Press, 2006), and Andrew Kirk, “Appropriating Technology: The Whole Earth Catalog and Counterculture Environmental Politics”, *Environmental History*, Vol. 6, No. 3 (Jul., 2001), pp. 374-394.

138 Jackson, *Crabgrass Frontier*, and Thomas Sugrue and Kevin Kruse, *The New Suburban History*, (Chicago: University of Chicago Press, 2006).

139 Kaiser, “The post-war suburbanization,” and Sugrue and Kruse, *New Suburban History*.

on the suburbs and physics in the research university, “work had become a means to another end...the suburban lifestyle had to be purchased at the expense of a job well done.”¹⁴⁰ Essentially, the bold frontiersmen of yesteryear had achieved material comfort by working hard to create the material goods they consumed, and could sit down at the end of the day with a sense of satisfaction that they had built something valuable and worthwhile. But the modern 9-to-5, white-collar worker toiled all day at a job he didn’t care about, in order to trade his money for material objects which he was completely alienated from.¹⁴¹ Stewart Brand’s *Whole Earth Catalog* followers, and many other countercultural critics of 70s, posited the DIY ethos as a cure to suburbia, a return to roots and the Frontier.¹⁴²

This criticism of Suburbia was certainly alive and well in the L-5 community, and many members of the pro-space movement of the 70s saw space colonization as the ultimate DIY endeavor, an escape from suburban consumerism. In fact, one of the main selling points of L-5 for many members of the society was that roughing it on the edge of space, in a situation where goods could not be purchased and had to be won through hard, earnest labor, would be an antidote to the hollowness and dissatisfaction they experienced in their suburban, consumerist lives. The original plan for L-5, posited by O’Neill and NASA is that the space station which would initially go up, hopefully by 1995, would be a mining colony. The original colonists who settled there (and who would participate in the portion of the program most likely to take place during L-5 member’s lifespans), would work as blue collar miners. They would spend the first many years of the stations’ existence doing hard, manual labor to extract the raw materials from asteroids, everything from operating heavy machinery in the dangerous void of space to drill ores out of asteroids to smelting it down and casting parts to assemble buildings, industrial machinery, solar panels, and the next round of space stations. Other colonists would work as agricultural laborers, farming enough food to sustain the rest of the colony. The government would provide the skeleton of the space colony, which would be built on the ground, but everything too expensive to ship up, which would be needed to bring the colony up to the final levels of industrial production and a middle-class standard of living, would need to be built from scratch by the colonists.

140 Kaiser, “the post-war.”

141 Ibid.

142 Kirk, “Appropriating Technology,” and Turner, *From Counterculture to Cyberculture*.

These details didn't initially seem to bother many L-5 members; in fact, many saw it as a plus, because it meant that their individual contributions would be absolutely necessary to the survival of the space colony and therefore valued. Writing about the hypothetical experience of growing up on a space colony, Heppenheimer wrote "far from being psychologically damaging, such societies are among the healthiest places for children to grow up. Such children will rarely suffer anomie, or rootlessness, or alienation...they will be cherished and valued in a society with much work and too few people to do it."¹⁴³ In an *L-5 News* letter to the editor in 1976, Robert Sprankle, a member of the society wrote "During the 1800s in America, the vastness of the unexplored continent increased the value of each individual in the westward movement."¹⁴⁴ Asimov seconded this vision, writing in *Chrysalis* "the people who live in space will be aware at every moment that they are filling their little world to capacity, the every mouth must be counted, that every atom must be recycled," presenting the scarcity of resources in space as an almost spiritual experience – as an alternative to the mindless wastefulness of the suburbs.¹⁴⁵ In all these visions of Frontier life, there is a common thread – living in a community where everyone lives by their own hard work makes each individual and each individual bit of work important and meaningful.¹⁴⁶ Space-colonist hopefuls wanted to believe that L-5 would be an escape from the dull drudgery of a 9-to-5, where anyone could vanish into a sea of gray flannel suits.

Members of the L-5 Society also looked forward to L-5 as a project for the greater good of humanity which they could take part in – a cause to rally around which would provide an antidote to office busywork and the hedonic treadmill of consumer society. In his letter to *L-5 News*, Sprankle goes on "the unknown promot[es] cooperation...Americans will be drawn much closer together as they challenge the vastness of the universe...America will once again become one family, pushing back an infinite wilderness."¹⁴⁷ The idea of being part of a uniting project appealed to many members of L-5, who, as mentioned above, constantly stressed L-5 as a step in the chain of human expansion and Progress. Envisioning life on the frontier in space, James and Ronald Drummond wrote to *L-5 News* "these people would be motivated not only by high

143 Heppenheimer, "A Strollin' in the Astroturf."

144 Robert Sprankle, Letter to the Editor, *L-5 News*, Aug 1976.

145 Asimov, *Chrysalis*.

146 Regis, *Great Mambo Chicken*, and Westwick, "From the Club of Rome to Star Wars"

147 Sprankle, letter to the editor.

wages, but by their own personal stake in space.”¹⁴⁸ Unlike 9-to-5 office workers, who were seen as doing busywork that no one needed in order to make enough money to buy the things needed only to sustain their own extravagant way of life for another day, every bit of work that the imagined subsistence farmers of L-5 did contributed directly to a greater cause, the human project of Space Colonization.

However, despite these prominent and vehemently anti-suburban/consumerist attitudes, the issue of consumerism, real estate, and central planning was often a contentious one within L-5, and the actual imaginings of the landscape of L-5 which the society produced often seemed much more sympathetic to the idea of the suburbs. The L-5 Society’s unofficial anthem, *Home on Lagrange* (a parody of the classic frontier-nostalgia country song, *Home on the Range*), ends tellingly:

“I’m sick of this place, it’s just McDonalds in Space
And living up here is a bore
Tell the shiggies don’t cry, they can kiss me goodbye
‘cause I’m moving next week to L4”¹⁴⁹

Though the tone is obviously a little tongue-in-cheek, this verse, slipped in at the end of the song, is poking fun at some sort of infighting within the community. By 1978, when this song was written, some members of the society (and perhaps even the song’s authors) were beginning to fear that the project was compromising on its anti-consumerist values. This same point also came up in countercultural critiques of other pro-space groups. For instance, one hippie derided Leary’s SMI2LE as “THE ULTIMATE IN SUBURBAN LIVING, the SWIMMING POOL IN SPACE.”¹⁵⁰ David Thompson, a more countercultural college student who went to hear Keith Henson speak at his university returned disillusioned and said in an interview with Ed Regis “He got me really mad...Henson was selling this concept like he was selling real estate.”¹⁵¹ Even

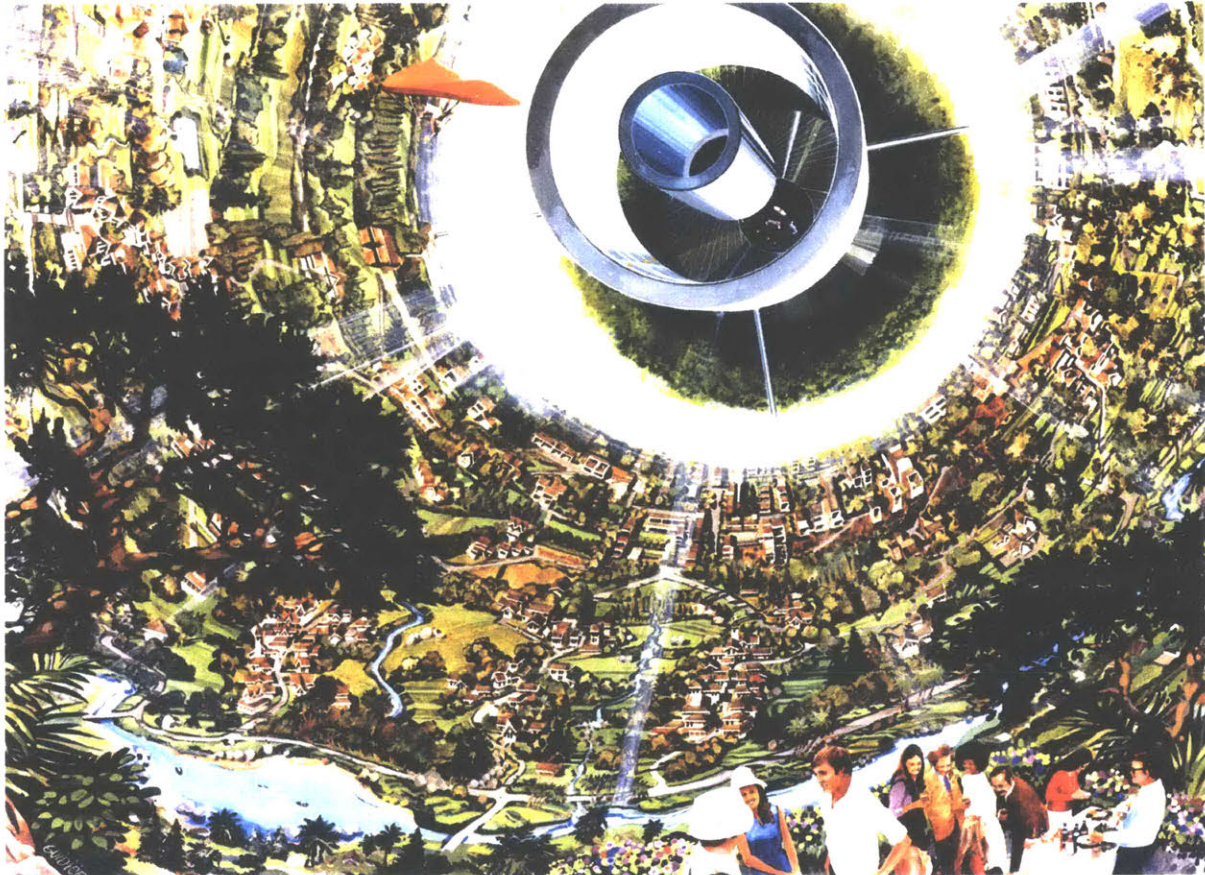
148 Ronald Drummond, untitled, *L-5 News*, October 1976.

149 “Home on Lagrange,” *NESFA Filk Hymnal*. “Shiggies” here is a reference to Josh Brunner’s 1968 dystopian sci-fi novel about an overpopulated earth, *Stand on Zanzibar*. In it, “shiggie” is a somewhat derogatory word for woman, with the added connotation of someone earthbound, and potentially prostituting themselves in order to jockey for space on an overcrowded and resource depleted world.

150 McCray, *The Visioneers*.

151 Regis, *Great Mambo Chicken*.

within the first year of the L-5 Society's existence, tensions between the idea of L-5 as mining colony versus L-5 as suburban real estate development were beginning to surface.



Rick Guidice. *Interior Including Human Powered Flight*. 1975. Medium and original dimensions unknown. NASA archives, ID Number AC76-0628. From: <https://settlement.arc.nasa.gov/70sArtHiRes/70sArt/art.html>

For starters, O'Neill's original vision for the L-5 space station, while generally counter-cultural and out-there, did actually look rather suburban. In an interview in the mid 70s, O'Neill described his ultimate vision for an L-5 space station:

“ [I] would have a preference...to leave the valleys free for small villages, forests, and parks, to have lakes at the valley ends, at the foot of mountains, and to have small cities rising in the foothills from the lakeshores. Even at the high population density which

might characterize an early habitat, that arrangement would seem rather pleasant: a house in a small village where life would be relaxed and children could be raised with room to play; and just 5 or 10 miles away, a small city, with a population somewhat smaller than San Francisco, to which one could go for theaters, museums, and concerts.”¹⁵²

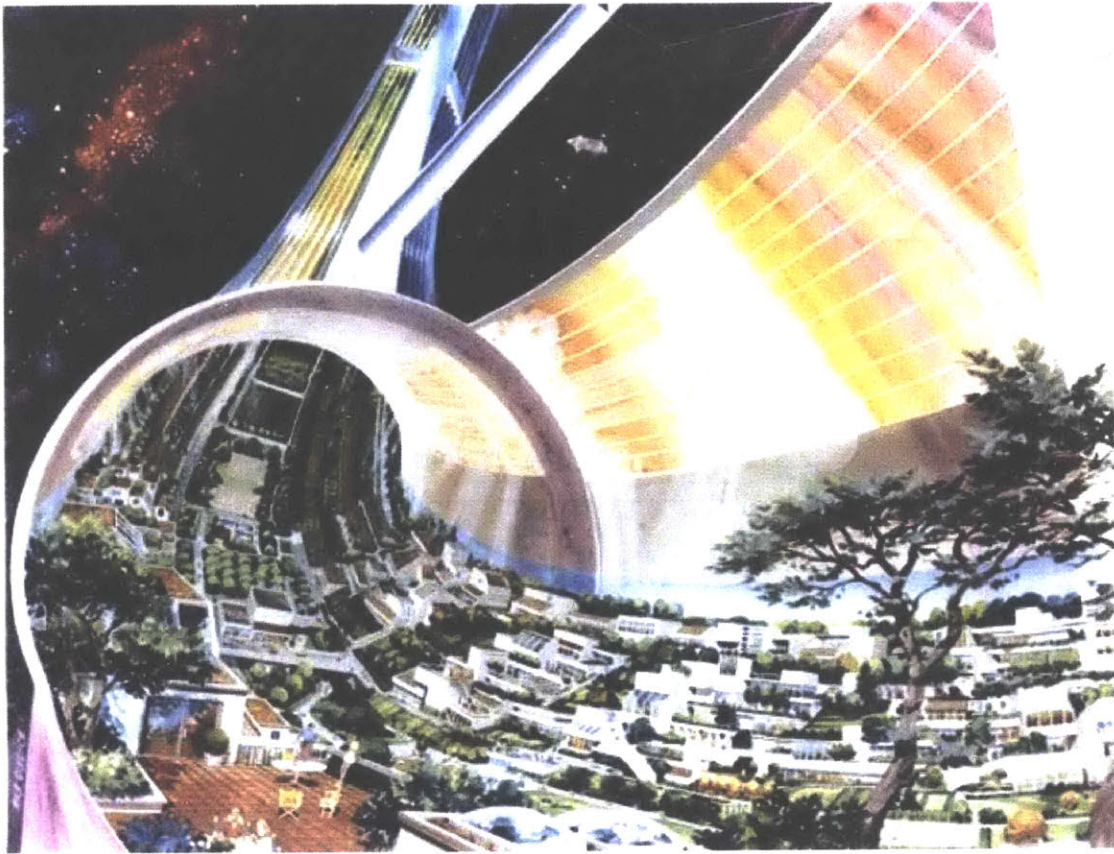
Though he doesn't use the word explicitly, there has historically been a name for a kind of landscape five to ten miles from a larger city where people move when they want a nice (and safe) place to raise their kids (with a good school system) while still not giving up the conveniences of living near a major city: it is often called Suburbia. The visuals that O'Neill used to sell his vision in particular often depicted a sort of lush suburban greenery – ranch-style houses, uniformly plush green lawns, and low, spread out buildings.¹⁵³ They have been described by multiple writers, contemporary and otherwise as “suburban.” Commenting on the designs he drew for O'Neill, the artist Rick Guidice, betrayed the true nature of the cities depicted in them with just the descriptor “not very dense.”¹⁵⁴ Though O'Neill stressed his plans for the mining-colony phase of the space habitat in his presentations to NASA and the government, and though these plans made up an essential part of the economic model of the L-5 design, this scrappier, more rugged phase of the colony never seemed to make it into the visuals. There is reason to believe that O'Neill intentionally used these suburban depictions of an L-5 habitat to increase the popularity of his designs. One argument he would frequently make is that an L-5 habitat would be “far more comfortable, productive, and attractive than most of the earth.”¹⁵⁵

152 Regis, *Great Mambo Chicken*.

153 Westwick, “From the Club of Rome to Star Wars,” and Bjornvig.

154 Rick Guidice, quoted in Evan Nicole Brown, “Looking back on NASA's Vivid 1970s Visions of Space Living,” *Atlas Obscura*, November 13, 2018, <https://www.atlasobscura.com/articles/nasa-space-colony-art>, last accessed 5/9/2019.

155 McCray, *The Visioneers*.



Rick Guidice. *Cutaway View, Exposing The Interior*. 1975. Medium and original dimensions unknown. NASA Archives, NASA ID Number AC75-1086-1. From: <https://settlement.arc.nasa.gov/70sArtHiRes/70sArt/art.html>.

The highly manicured and planned character of O'Neill's designs might leave one wondering who exactly is writing the zoning laws to create all these small "villages" and "lakes" and who is maintaining these museums and concert halls that towns in this libertarian utopia will supposedly come ready-made with? It might be a natural assumption that the frontiersmen of L-5 would chafe at O'Neill's polishing up of their rugged frontier gem. But for the most part, they didn't. Members of the L-5 Society used O'Neill's illustrations as slides for presentations, and featured them on the cover of *L-5 News*. I have come across few complaints about the art itself in my survey of *L-5 News*. This is perhaps partially because members of L-5, like O'Neill, understood the importance of advertising. "You all know, we have to recruit residents to our space colony and and that the people are much more likely to volunteer for something with a

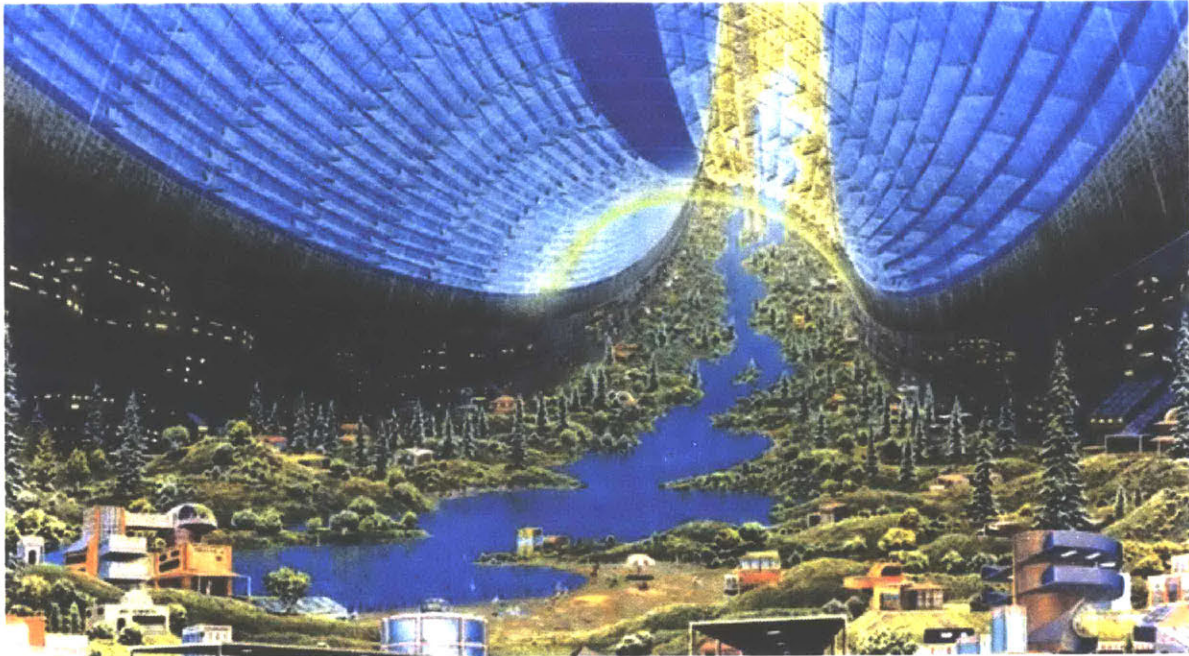
lovely name than they are for something called Mudville,” said Isaac Asimov in an L-5 adjacent community design workshop for space.¹⁵⁶ Perhaps they felt the same way about pretty visuals.

But there is also evidence that, as soon as they started looking into the particulars, members of the L-5 Society grew increasingly lukewarm on the idea of a mining colony. Speculative fiction about L-5 written by members of the society would occasionally nod to the mining phase of the colony, when colonists would live in a stripped down “construction shack” – but by 1976, this subsistence phase was rarely framed as the goal, rather than as a temporary period of unpleasantness that had to be put up with in order to make it to the actually desirable phase.¹⁵⁷ Summarizing NASA’s 1975 summer study on space colonization for *L-5 News*, C.H. Holbrow wrote “the facts of the design [are] the tedium of life in space, the long hours and hard work in what is really a small isolated community narrowly focused on a few productive tasks. The colony is definitely a frontier community and as such not to be romanticized.”¹⁵⁸ Here, the phrase “frontier community” is used in an almost derogatory way, as a warning – a clear break from the idealized frontier setting of earlier space writing.

156 Asimov, *Chrysalis*.

157 Heppenheimer, “Home, Home, on Lagrange.”

158 C.H. Holbrow, “1975 Study Report,” *L-5 News*, Sept 1976.



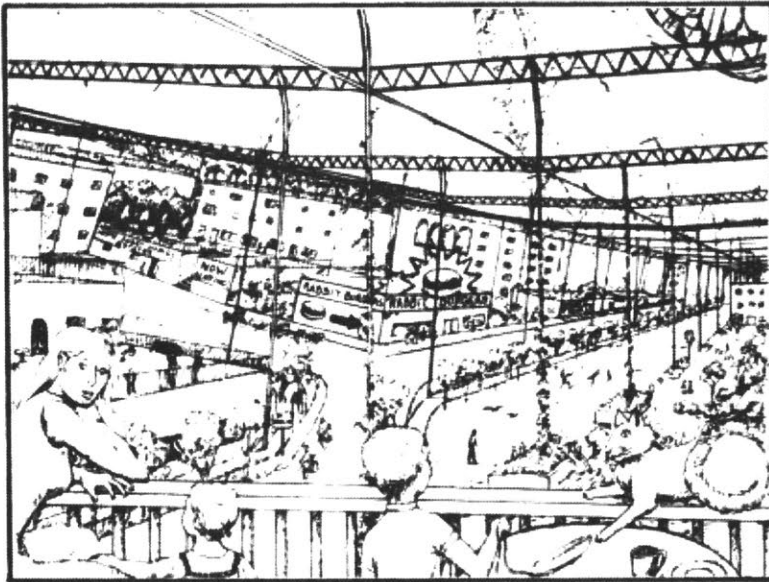
Don Davis. *Toroidal Colonies – Interior View*. Medium and original dimensions unknown. 1976. NASA Archives ID Number AC75-2621. From: <https://settlement.arc.nasa.gov/70sArtHiRes/70sArt/art.html>.

It quickly became evident that many L-5 members were more enticed by O’Neill’s glossy illustrations than by the rugged reality of frontier life. The anthropologist Magoroh Maruyama, writing for L-5 news in 1976, argued that one of the bonuses of a space colony is that its environment and climate can be completely controlled by the colonists in order to create somewhere pleasant and desirable – somewhere so controlled, in fact, “in the future, Earth might be looked at as an uncomfortable and inconvenient place...a historical museum, a place that contains harsh climates for those who love physical adventures, or as a primitive and primeval place for tourism.”¹⁵⁹ In the same issue of *L-5 News* which ran Heppenheimer’s story “Home, Home On Lagrange,” one of the more earnest depictions of rugged mining colony life, the issue concludes with one of Don Davis’s illustrations of O’Neill’s designs, which Don Davis describes:

159 Magoroh Maruyama, “Cultural Fiction Group to Discuss Extraterrestrial Communities,” *L-5 News*, Jan 1976.

“[colonists] would live and work in an earthlike environment inside a vast wheel...trees, grassy parks, birds – even streams and ponds will give a familiar setting for the colony’s population. Beneath the upper living area is a level of offices, stores, service buildings and facilities for light industry.”¹⁶⁰

Evidently, backbreaking mining labor was becoming replaced with “light industry” and 9-to-5 “office” jobs were making their way back into the picture.¹⁶¹ A drawing by Carolyn Henson in the next issue must have given fuel to the disgruntled L-5 member who wrote the “McDonalds in space” line – it shows a bustling urban street corner, complete with a gaudy “rabbit burger” fast food joint.¹⁶² Thus, despite the general excitement about the freedom, meaningfulness, and respectability of the rugged frontier, visions of a planned and polished, low-population-density paradise remained very seductive to many L-5 members, and the more rough-hewn stage of the space colony often became elided in favor of the glittering finished product.



Artist's conception of "Crystal Palace" habitat Drawing by Carolyn Henson.

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Carolyn Henson. “Artist’s conception of a ‘Crystal Palace’ habitat.” 1976. Medium and original dimensions unknown. From: *L-5 News*, Aug 1976.

¹⁶⁰ Don Davis, “Interior View of a Stanford Torus,” Aug 1976.

¹⁶¹ Ibid.

¹⁶² Carolyn Henson, a proponent of L-5 subsistence agriculture and enthusiastic rabbit breeder, was somewhat obsessed with the idea of L-5 colonists raising rabbits as their main source of meat.

In fact, it was not uncommon for L-5 members to become so attached to the glossy vision of L-5 promised by O'Neill's posters that they began to worry that the mining stage of the colony or a more frontier-like arrangement might threaten its chance to become a reality. Bert Swanson, a participant in the aforementioned design workshop that Asimov attended, wrote "[if] the colony will only have one industry [ie. asteroid mining], it presents some disadvantages for the people living there.¹⁶³ Concern will be focused on the industrial area, rather than having the lush, suburban setting pictured by Gerard O'Neill, the living quarters will remain spartan at best, and the system will be highly resistant to change..."¹⁶⁴ Though L-5 was early on characterized by excitement about being the *first* to settle space, and to live on a totally unexplored and unrefined frontier, many members realized that they did not actually want to spend all their days doing back breaking manual labor, much less doing so to create a shiny future they might never get to live in – and they realized that a mining colony was not going to look like O'Neill's vision, not likely for a long time. By 1976, many L-5 members were looking for a different structure for life on L-5. "Living arrangements would probably be a combination of transient accommodations, rentals, leases, and purchases comparable with hotels, apartments, and houses or condominiums on Earth. I can envision a Hilton, or a Holiday Inn perhaps," Peter Siegler wrote, half jokingly, to *L-5 News*.¹⁶⁵ This particular image was picked up by other members of the society: "we could even have, in years to come, a Hilton Hotel in space," wrote Robert Frietag in another article.¹⁶⁶ Swanson's eventual conclusion? "Suppose we treat the whole project like one giant real estate development."¹⁶⁷ As issues of *L-5 News* rolled on, this particular concept, that L-5 should be thought of not as a mining colony, but as real estate development begins to gain traction – the concept being that the government should fund L-5 as a real estate project that the government could develop and sell to private buyers who wanted to live in space.

In 1978, ten years after he started the *Whole Earth Catalog*, Stewart Brand wrote, in a companion volume to the tenth anniversary edition, *Soft Tech*, "anyone who has tried to live in total self-sufficiency...knows the mind numbing labor and the frustration and real marginless

163 Bert Swanson, *Chrysalis*.

164 Ibid.

165 Peter Seigler, *Chrysalis*.

166 Robert Frietag, "Space Industrialization."

167 Swanson, *Chrysalis*.

hazard that go with the attempt. It is a kind of hysteria.”¹⁶⁸ The disillusionment that the L-5 society quickly came to feel about subsistence labor on the Frontier perhaps mirrored a general awakening to the same problem in the counterculture, and the pro space movement in general that was happening at the same time. Many astronauts, in fact, ran into the same disappointment – many of the early Skylab crews were excited to go to space, but when they got there, were upset with the crushing and mind numbing pace of labor and regimented routines needed for just a few people to keep a space station running.¹⁶⁹ They complained about these conditions so publicly that when the Skylab crew accidentally turned off the radio for a day in 1972, ground control and the press thought that they had gone on a labor strike in space. As Hersh argues in the “Man In the Gray Flannel Spacesuit” chapter of *The Making of the American Astronaut*, following the Apollo program, it became increasingly evident to astronauts themselves, and Americans in general, that being an astronaut was basically another day job – physical labor, even in the free and open environment of space, even as a part of the human project of space colonization, was not necessarily any less soul-crushing than the day to day grind of a suburban office job.¹⁷⁰ And, while the Frontier seemed to promise infinite freedom, the harsh dictates of nature, demanding that a colonist structure every moment of their life around the goal of surviving, didn’t actually offer much more freedom than a tyrannical boss. Ultimately, as Elton John put it in the 1972 song *Rocket Man*, telling the story of a disillusioned Martian astronaut:

“Mars ain’t the kind of place to raise your kids
in fact, it’s cold as hell and there’s no one to raise them if you did
and all this science I don’t understand
it’s just my job five days a week.”¹⁷¹

Throughout the history of the L-5 Society, and the process of negotiating how much of a mining colony, and how much a place to live, L-5 should be, the idea of L-5 as a Frontier, but also as Suburbia, were both very compelling to L-5 Society members. And to some degree, there

168 Brand in Kirk, “Appropriating Technology.”

169 Hersh, *Inventing the American Astronaut*, 112.

170 Ibid.

171 Elton John, “Rocket Man.”

is little evidence in the L-5 Society's publications, outside of the song *Home on Lagrange*, that most members saw this as a contradiction – with a project so futuristic and fuzzily defined, there was room to be excited both about a rugged frontier life as a miner and a home life as a member of a nice family in a nice suburban space-town, all in the same breath. The potential L-5 colonists wanted L-5 to be a sort of Eden: on the one hand, a garden where men can make a living honestly, off of the land, and through the work of their own two hands, and on the other, a lush, low-population-density, paradise which will always provide for its inhabitants.

“Planet Earth is blue, and there's nothing I can do”: *Nature, Environmentalism, and the Sublime*

The last aspect of the 1970s Frontier Myth which I plan to examine in this essay is the frontiersman's relationship with nature. One of core the qualities of the Frontier is that it is not just an uninhabited space, but a natural (and thus, implicitly, non-technological) space. As Leo Marx argues in *The Machine In The Garden*, in American history, the Frontier has often been where one goes to get away from the big city – the icon of technological industrialization – to live “off of the land,” in close communion with Nature.¹⁷² This aspect of the Frontier can be seen as an expansion of the previous points about autonomy, consumerism, and the DIY ethos – if the Frontier represents a place where a guy can get away from the phony, artificial, technological reality of capitalism, then the alternative must be somewhere genuine and non-industrial – but I argue that the element of the Sublime specifically, an experience with the natural world, was essential to the importance of The Frontier. The Frontiersmen of the 70s did not just want to live away from industry, they wanted to live *in Nature*. However, the question of what is actually “natural” becomes very complicated in an environment like outer space, where humans can only exist with the aid of extreme technological assistance. The question of “natural” and “technological” as it played out in the L-5 Society's search for the Sublime, is part of a broader

¹⁷² Leo Marx, *The Machine in the Garden: technology and the pastoral ideal in America*, (New York: Oxford University Press, 2000).

history of the 70s counterculture's complicated relationship with technology, which I will explore in this chapter.

It may seem obvious to a modern audience that Nature was important to tree-hugging hippies, but, going back in American history, Nature and the experience of the Sublime has been an important part of a more conservative-aligned understanding of the Frontier. The Sublime – a sense of nature as immensely large and powerful force far greater than any human being, which inspires a fundamental sense of awe in any human who encounters it – described in Turner's essay, is essential to the 19th century, Romantic view of the Frontier. Art historians often point to paintings of the Hudson River Valley school as exemplifying this ideology, capturing the wonders (and wondrous scale) of the uninhabited western United States.¹⁷³ The Sublime and the Frontier are linked since the Sublime is an aesthetic particular to uninhabited Nature – though we want to believe that Nature is greater and more powerful than any human actors, put enough human actors and technology on top of a patch of Nature, and we tend to start focusing on the human actors over the landscape. 19th century narratives of the Frontier and the West, and even earlier, 18th century narratives of settlers traveling to America, are often stories, not only of frontiersmen seeking freedom, but also seeking nature – leaving the over-crowded and over-industrialized East (or Old World), in search of a place where they can experience Nature in its true, uncontaminated glory. We see this trope repeated over and over again in Romantic paintings such as Caspar David Friedrich's *Wanderer Above A Sea of Fog* (1818) or Frederic David Church's *The Heart of the Andes* (1859), which show Nature as vast, powerful, mystical, and spiritual – but also something which can only truly be experienced when a lonesome traveler happens upon a secluded spot which has not yet been contaminated by human presence.¹⁷⁴ This vision of the Frontier and the Sublime stays alive and well in 19th and 20th century perceptions of the cowboy and the southwestern Frontier – the Romantic image of the rancher would mean nothing without the backdrop of the lonely Arizona desert.

173 Nicholas Mirzoeff, *How To See The World*, (London : Pelican, 2015).

174 *ibid.*



Caspar David Friedrich. *Wanderer Above A Sea of Fog*. 1818. Oil on canvas, 94.8 cm × 74.8 cm. Kunsthalle Hamburg, Hamburg, Germany. From: https://en.wikipedia.org/wiki/File:Caspar_David_Friedrich_-_Wanderer_above_the_sea_of_fog.jpg

Friederic David Church. *The Heart of the Andes*. 1859. Oil on canvas, 167.9 cm × 302.9 cm. Metropolitan Museum of Art, New York, New York. From: https://en.wikipedia.org/wiki/File:Church_Heart_of_the_Andes.jpg.

A similar mystical-spiritual view of nature was also important to the counterculture of the 1970s. In his analysis of the hippies, Tribbe describes the 70s counterculture as a sort of “Neo-Romanticism.”¹⁷⁵ Nature and the environment was a major part of the spiritual and political consciousness of the 1970s. Many American religious movements and American interpretations of non-christian religious movements such as Buddhism, Hinduism, and Native American religions, stressed a closer, “back to the roots” kind of connection with the natural world. The rise of natural food crazes, and pop cultural figures like the environmentalist-spiritualist folk singer Buffy Sainte-Marie are all indicative of this rising connection between nature and mystical spirituality.¹⁷⁶ It is perhaps no accident that the feather and leather-tassel wearing hippies, like the cowboys, held a romanticized image of Native Americans as living “off the land” and in spiritual communion with Nature. And this mystical-spiritual sense of nature was often explicitly tied to the environmentalist movement. Sometimes, religion and environmentalism were explicitly

¹⁷⁵ Tribbe, *No Requiem for the Space Age*.

¹⁷⁶ Ibid.

linked: the *Mother Earth News* newsletter, for instance, published Native American religious arguments against environmental exploitation. It even showed up on the side of the bottle of the hippie staple Dr. Bonners Castile Soap, where text informed shower-takers that Jesus Christ urged “in all that we do, let us be kind and loving towards spaceship earth.”¹⁷⁷ But even outside of explicit religion, an agnostic spiritual connection with Nature, or sense of the Sublime, was key to 60s and 70s environmentalist imagery. For instance, Rachel Carson’s foundational book, *Silent Spring*, repeatedly employed images of the wondrous vastness, yet self-containedness, of ecological systems, in order to make her environmentalist arguments.¹⁷⁸ The countercultural focus on concepts like Mother Earth and the unity of nature stressed environmentalism not only as a political ideology, but a spiritual one. In taking care of the planet and being environmentally conscious, members of the counterculture environmentalist movement believed that they were bringing themselves into a greater form of universal consciousness, an awareness on the scale of nature, as Dr. Bonner would say, the “All One or None.”

Following the moon landing, space increasingly became a part of the 1970s environmentalist Sublime. In 1968, Stewart Brand campaigned for a photo of the earth taken from space (fancifully named “Earthrise”), which became the centerpiece of the Whole Earth Catalog.¹⁷⁹ It symbolized a new mode of thinking of the earth as sublime, not in its vastness, but in its fragility – or perhaps, a mode of thinking of Space as the sublime vastness that lay beyond our old world.¹⁸⁰ “The trouble with us on Earth” wrote Isaac Asimov in *Chrysalis* “is that we mistake Earth for a Universe....the only time you realize how small the earth is, how fragile it is, how careful we must be of this tiny dust speck...is if we get out in space and look back on it.”¹⁸¹ Space as a sublime and mystical landscape is certainly a theme that is repeated again and again in the countercultural music of the 70s, from Black Sabbath’s transcendental jam *Planetary Caravan* to Jefferson Starship’s trippy space rock-opera *Blows Against The Empire*.¹⁸² The trope of Space as a “far out” new landscape with the power to transform and “evolve” human consciousness resounds again and again in countercultural media from *2001: A Space Odyssey* to

177 Emmanuel Bronner, Dr. Bronners soap bottle text. The full text can be read here https://rationalwiki.org/w/images/f/f4/Bronner_FullLabel.jpg, last accessed 5/9/2019.

178 Rachel Carson, *Silent Spring*, (Boston : Houghton Mifflin,1962).

179 McCray, *The Visioneers*.

180 Kirk, “Appropriating Technology.”

181 Asimov, *Chrysalis*.

182 Black Sabbath and Jefferson Starship, in Tribbe, *No Requiem for the Space Age*.

Timothy Leary's *Neurocomic*.¹⁸³ Hippies often compared spiritual experiences with entheogenic psychedelics to space travel. In the 1968 musical *Hair*, a group of tripping hippies sing

“My body is walking in space
My soul is in orbit with God face to face
...
Walking in space we find the purpose of peace
The beauty of life you can no longer hide.”¹⁸⁴

The idea of “space madness” or “space insanity” - a more negative sort of spiritual experience with space where a person is so profoundly overcome by the experience of outer space that it shatters their conventional sanity, recurs again and again in 60s and 70s sci fi media, as well as space journalism.¹⁸⁵ When Buzz Aldrin returned from the moon severely depressed, or when Apollo 12 astronaut Ed Mitchell decided to try out experiments in psychic transmission on his flight, a common media narrative was that these astronauts had been driven mad by having the super-human consciousness of the void thrust upon them. David Bowie's hit *Space Oddity*, released just five days before the moon landing, tells the story of a man, in the true fashion of Turner, being thoroughly overcome by an encounter with the sublime wilderness. The protagonist, Major Tom, manages to escape the consumerist demands of earth life (“and the papers want to know whose shirts you wear”) only in outer space, where, starstruck, he cannot help but helplessly respond “planet earth is blue, and there's nothing I can do” in response to the numinous vastness of the void.¹⁸⁶ Perhaps Leary's ludicrous claims that going to space could expand his mind and unlock his latent psychic powers were not actually too far off from Wordsworth or Shelly's descriptions of the wilderness as a mystical place where man may commune with God or be Inspired with ethereal philosophical insights.

The discussion up until this point has been mostly of the hippie counterculture in the late 60s and early 70s, but by the mid 70s, much of this sublime understanding of space and nature

183 Timothy Leary, *Neurocomic*.

184 Jerome Ragni and James Rando, “Walking In Space,” track #26 on *Hair Original Broadway Cast Recording*, RCA Victor, 1968.

185 Hersch, *Inventing the American Astronaut*.

186 David Bowie, “Space Oddity,” on *David Bowie (Space Oddity)*, Trident Studios, 1969.

was becoming more relevant across the aisle and in the mainstream culture, due to events and shifting cultural forces which made environmentalism a more attractive ideology to the right. In the 1970s, environmentalism in general was on the rise among both conservatives and liberals, owing in part to concerns about overpopulation and dwindling resources.¹⁸⁷ In *The Visioneers*, McCray highlights how the Club of Rome's "Limits to Growth" study shaped popular understanding of science, economics, and environmentalism throughout the 70s.¹⁸⁸ Fears that overpopulation, environmental catastrophe, and resource depletion might not just reduce the quality of life in the long term, but also limit capitalist expansion and economic growth in the short term, made the left and right alike concerned about consumption, pollution, and energy sources. It also made both groups more open to technological solutions, even ones as drastic as space colonization. Energy, for instance, was one such issue. The oil crisis in 1973, especially heightened conservative interest in alternative, environmentally friendly, fuel sources like solar power, bridging the gap between environmentalist hippies and conservative industrialists.¹⁸⁹ In the framing of the oil crisis, alternative energy sources meant less dependence on foreign oil, so solar power could be reframed as a patriotic pursuit about American liberties. The technological solution to the problem of limited resources promised to give everyone what they wanted: the industrialists wouldn't need to stop producing in order to protect spaceship earth.

The oil crisis's making of strange bedfellows around environmentalism often made its way into debates about the environment, technology, and futuristic living. The confluence of capitalist and environmentalist ideologies also often colored the conversation about space and sustainable living, especially solar power: "In a time of dwindling energy supplies," said Udall, in a statement to congress reprinted in the L-5 newsletter, "I am deeply concerned that every reasonable avenue should be pursued vigorously in the quest for new energy generating sources."¹⁹⁰ "Once the decision had been made that [Solar Powered Satellites] will be economically competitive," said Senator Wendell Ford, in another address, "then the public will accept it because of the environment and that sort of thing," illustrating how environmentalism easily became a secondary goal of industrial expansion due to a new consciousness of the

187 McCray, *The Visioneers*.

188 Ibid.

189 McCray, *The Visioneers*, and Geppert, "the post-Apollo paradox."

190 Udall, "Morris K. Udall Supports O'Neill."

importance or resource conservation and energy independence.¹⁹¹ In general, space as a limitless treasure trove of resources, where industry would not need to worry about pollution or resource depletion, became an increasingly attractive idea to right wing politicians, and one that L-5 used to push their space colonization agenda. “On earth you have a biosphere subject to pollution,” wrote Robert Frietag, a manager at NASA, wrote for an *L-5 News* article “any materials which you have in space would just eventually travel off in space...[in space] we have unlimited power, solar power...free resources of space are what I’m talking about.”¹⁹² However, these solutions for industrialists also fulfilled the agenda of environmentalists. “You will find that your strongest support for [the Solar Power Satellites] bill,” wrote Shirley Ann Varughese, an environmental activist and L-5 member “could come from ecology oriented groups. Clean energy and a clean environment go hand in hand. An efficient source of solar energy is the ecologist’s dream.”¹⁹³ Space travel could be presented as a way to free the Earth from environmental exploitation (as per the old L-5 slogan “If you love it – Leave it”), but also as a new opportunity for American industry to expand, free from the limits of the earth and other countries.

As environmentalism crossed over from the counterculture into the mainstream, occasionally the hippie’s neo-romantic ideologies about nature and technology did as well. As described in the introductory sections, mainstream excitement about atomic age design was starting to fade in the early 70s, and was quickly being replaced by fear of technological hubris and abuse of technology.¹⁹⁴ And as an alternative, many Americans were turning to nature. Visual culture historian Thomas Hein traced this shift in interior design – in the mid 1970s, sleek chrome countertops, bright colors, and 50s futurism were starting to make way for wood paneling, green and earth tones – and houseplants.¹⁹⁵ Increasingly, Americans were becoming disillusioned with a very particular failed technological vision of the future – the concrete-lined,

191 Wendell Ford in Alice Babcock, “Senator Wendell Ford on Power Satellites,” *L-5 News*, March 1976.

192 Frietag, “Captain Frietag.”

193 Shirley Ann Varughese, “More Comment,” *L-5 News*, Nov 1975. She also criticizes the bill for its use of male pronouns: “I hope you can have the wording altered so that 52% of the population is not left out by the sin of semantic emission.”

194 Kirk, “Appropriating Technology,” Geppert, “post-Apollo paradox,” and Westwich, “from the Club of Rome to Star Wars.”

195 Thomas Hein, *The Great Funk: Falling Apart and Coming Together (On a Shag Rug) In the Seventies*, (Farrar, Straus and Giroux, 2007).

greenspace-lacking Inner City. A 1971 Times article on suburbanization made it clear that at that point, seeking “green open spaces” as a major reason that many adults moved to the suburbs – looking to raise their kids around nature.¹⁹⁶ America had come out of the space age with a bad fit of cabin fever – a desperate desire to clap eyes on anything green, and was ready to join the hippies in seeking out nature and the Sublime.¹⁹⁷

Despite numerous parallels with Romanticism, as all this talk of space might suggest, the hippies, and by proxy increasing amounts of American mainstream culture by the mid 70s, did have a more complicated relationship with technology than the Romantic poets. It is common to characterize the hippies as an anti-technological movement. This was certainly the classification that Theodore Rozack used in his 1968 study, *The Making of the Counter Culture*, where he described the counterculture as a kickback against the “technocracy.”¹⁹⁸ Charles Reich’s *The Greening of America* (1970) also described the counterculture-environmentalist movement as a rejection of technology, which hippies believed “de-emphasized contact with the non-human world.”¹⁹⁹ But several more recent writers have drawn attention to the ways in which the hippies did not unilaterally reject technology. Andrew Kirk points out how by the early 70s, “primitive wood stoves and survivalist supplies for neo-luddites” could be found on the same pages of the *Whole Earth Catalog* as “geodesic domes, and oscilloscopes.”²⁰⁰ This could be a feature of the counterculture being made up of many differing sub-groups or individuals with differing viewpoints, but drawing on individual anecdotal accounts, it is highly likely that many people who rejected some forms of technology embraced others - as Tribbe points out, many of the same countercultural figures who protested military research in universities and rejected industrial agriculture, also played electric guitars at Woodstock, and took up LSD, pretty much the most synthetic drug around, as their spiritual symbol.²⁰¹ Kirk draws attention to movements like “soft technology” and “appropriate technology,” which advocated for using technology, but in a way which drew the user closer to nature, rather than separating them from it. For instance, E. F. Schumacher’s book *Small Is Beautiful* (1973) advocated for “intermediate technologies,

196 “Suburbia: A New Plurality,” *Time*.

197 Jackson, *Crabgrass Frontier*.

198 Rozack, in Kirk, “Appropriating Technology.”

199 Reich, in Tribbe, *No Requiem for the Space Age*.

200 Kirk, “Appropriating Technology.”

201 Tribbe, *No Requiem For the Space Age*, 172.

halfway between traditional and modern technology...as a solution to the dissonance between Nature and the technological world,” arguing for technologies which would allow for small, local agriculture, keeping everyone close to the earth.²⁰² Communes like Alloy and Biosphere II, and environmentalist technologist movements like Stewart Brand’s New Alchemy Institute often embraced DIY technology as a way to live ecologically and independently.²⁰³ Unlike previous environmentalist movements, which often advocated for a total return to nature, many hippies believed that there were good and bad sorts of technology, and good and bad uses of technology – and that, perhaps, the only way to counter the evils of industrial society were to use technology against technology, to learn how to live off the grid. As a 1969 Newsweek article put it “members of New Mexico’s New Buffalo commune harvested wheat by hand – the way the Babylonians did 3000 years ago...it’s not that hippies have anything against technology...but the hippies believe that technology is operating in a spiritual vacuum.”²⁰⁴ However, as the apparent confusion on the Newsweek author’s voice at the hippie’s choice to recreate ancient Babylonian methods belies, whether or not a use of technology was good or in tune with nature was not always clear – there was still a great deal of boundary work that needed to be done.

The hippie’s fraught relationship with, and simultaneous optimism and pessimism for technology made it to conversations about space and space habitation as well. Tribbe argues in *No Requiem for the Space Age* that in the 70s, the mainstream framing of the space race was often that it was a “triumph of the squares” and that hippies were unilaterally opposed to the space program as a wasteful, colonialist, display of American greed and nationalism.²⁰⁵ However, he goes on, many hippies were actually quite excited for the possibility of space colonization. They just took issue with the way technology was employed in order to get there. As the leftist sci-fi author Harlean Ellison wrote of the moon landing, “I’ve been dreaming...along with all the other SF fans about the moment when men get lunar dust on their boots...but there were so many negative vibes attendant on the project that it really brought me down.”²⁰⁶ As Ellison’s excitement, followed by unexpected disappointment brings out, while the hippies were more comfortable with grey areas between good and bad technology than previous anti-modernist

202 Kirk, “Appropriating Technology.”

203 Kaiser and McCray, *Groovy Science*.

204 Tribbe, *No Requiem For the Space Age*.

205 Ibid.

206 Ibid.

movements had been, there was still a lot that had to be worked out, especially around space travel and colonization. Tribbe tells the story of a hippie who got high to watch the moon landing expecting it to be a great cosmic trip, but ended up getting bummed out by how corporate and industrial the whole production was.²⁰⁷ A great deal of countercultural music and art from the early 70s deals with space travel, but ultimately, it is very vague on the how of actually getting there. The hippies tended to object to any actual proposed method as too authoritarian, soulless, or unnatural. It is perhaps no accident that Arthur C. Clark, the author of the book which became *2001: A Space Odyssey*, is also most famous for proposing “Clark’s Law”: “Sufficiently advanced technology is indistinguishable from magic.” We can perhaps think of Clark’s law as a sort of aspiration for the 1970s counterculture - they didn’t have a problem with technology, but they didn’t want their technology to feel technological.

I argue that space presented a particular problem for 70s environmentalists, since it was so clearly a technological environment, yet also, potentially, a natural one. Obviously, technology was central to the counterculture’s conception of space and the Sublime – NASA engineers had, after all, sent up the rockets which came back with the Earthrise photo which became the altar of the environmentalist movement. Space was perhaps the most primitive, original wilderness – it has existed untouched longer than human life itself, and, before the mid 60s, was completely untouched by humans. However, it was also impossible to deny the technological and anti-natural nature of space. As Lewis Mumford wrote around the time of the moon landing “outer space...is the realm of the machine, not flesh and blood.”²⁰⁸ In “Mediated Perception: Towards and Experience of Extreme Environments,” Ted Kruger argues that the problem with space is that we cannot experience it without extreme technological mediation – no one has ever truly been *in* space, they have just been in a space ship or a space suit.²⁰⁹ We can think of the question about space that plagued the counter culture of the 70s as: Should we think of space as a part of the natural world, or something that is made up of the technologies that we use to get and live there? Can space truly play the role of the Frontier if we can’t go there without technological assistance, meaning that it will never be a place entirely untainted by human presence?

207 Ibid.

208 Ibid.

209 Ted Kruger, “Mediated Perception: Towards and Experience of Extreme Environments,” in *Mutamorphosis Conference Proceedings*, Feb 3rd, 2003, <https://mutamorphosis.wordpress.com/2009/03/02/mediated-perception-towards-an-experience-of-extreme-environments/>, Last accessed 4/9/2018.

All of these questions come to a head in a series of articles written by Tom Heppenheimer for *L-5 News* in 1976. Heppenheimer, an aeronautic engineer and historian of flight, was one of the more regular contributors to *L-5 News*, and one of the contributors more interested in the question of what life on L-5 would actually look like (for instance, he was also the author of *Home, Home on Lagrange*, a short story about daily life on an L-5 space station). In an article in May, 1976, he seeks out to address what he considers to be “[a]mong the most frequently voiced objections to space colonization...: ‘wouldn’t it be simply dreadful to live in a totally artificial environment? With nothing there that is the work of Nature?’”²¹⁰ This is a concern which was frequently raised in the L-5 Society – for instance, in 1975 Magoroh Marayama wrote that nature is important on a space colony because humans need to interact with the unpredictability of living things, to be able to care for something that can grow and change, in order to stay psychologically healthy.²¹¹

Heppenheimer does start the article with a token nod to the idea that artificial nature could be created in the space station “stressing the care and attention to be given to the architectural design, to the importing of trees and greenery,” planting trees to mimic forests and building concrete rocks and other natural formations.²¹² However, Heppenheimer then goes on to argue that there is no real need for the colony to import nature, because Space itself is a form of nature more profound than anything colonists might encounter on earth: “the sky in the desert is beautiful...yet the experience may pale in comparison to the starry overwhelm which will be a colonists common experience.”²¹³ He eventually posits, like Turner, that space is an environment that will overwhelm and shape colonists, making them the “people of space.” Here, Heppenheimer is positing a role of space as the Sublime, a presence larger than humans whose presence reminds them of the majesty and scale of the natural world, filling their life with a sense of meaning.

However, over the course of 1976, Heppenheimer’s vision of where nature on an L-5 station should come from shifted, paralleling the previously discussed debates about mining colony vs. suburbs. In that debate, the main focus was not nature located outside of the space

210 Heppenheimer, “A Strollin’ In the Astroturf.”

211 Magoroh Marayama, “Heterogenistics,” *L-5 News*, April 1976.

212 Heppenheimer, “A Strollin’ in the Astroturf.”

213 Ibid.

station, but artificial nature located inside it – sculpted lakes, ponds, hills, valleys, and waterfalls. This nature was often seen as icing – the nice details in O’Neill’s drawings which were there to make it look pretty and pleasant to live in, perhaps necessary for the colonists happiness, but not for the colony to function. In short, nature was treated the same way as it would be in an architectural development in the big city, rather than as part of an attempt to create an ecosystem, or an accurate replica of the earth. For a stripped down mining colony, Heppenheimer’s appeal that colonists could touch real nature, getting to work in the vast starry skies or space, might have been promising. But without any trees, a mining colony did seem like a dismal place to work. “A space colony’s probably going to look more like the inside of a Greyhound bus than it’ll look like any of these paintings,” one disillusioned observer of O’Neill’s designs told Regis.²¹⁴ As the L-5 Society shifted towards focusing on the housing development phase, rather than the mining colony phase of the planned space habitat, writings tended to focus on a point in time when artificial nature had already been constructed inside the colony, covering up the seems and hiding the bare-bones technology which made up the space station. The copy text accompanying Don Davis’s drawing for instance, reads “trees, grassy parks, birds – even streams and ponds will help give a familiar setting to the colony’s population.”²¹⁵ The definition of “nature” shifted inwards as the space colony became more hermetically sealed in the L-5 Society’s visions. If the colonists are laborers working on the scale of the colony, then they interact with the space outside it, and view it more as their spaceship which allows them to pass in the natural habitat of space. However, if the colonists are treating the colony more as a new earth, which they live on as passengers, then they will primarily only interact with nature as the artificial nature brought onto the colony to replicate the nature of old earth.

Ultimately, nature in the dreamscape of L-5 came to look much more like the suburbs than the sublime wilderness. Nature became not an all encompassing thing which “overwhelms the colonist” but something which can be potted and transplanted into the middle of industrial society, to spruce it up a little bit. Sure, this nature is necessarily artificial – Heppenheimer admitted in his original article that any nature imported or designed this way will always look a little artificial: “the colonists will forever be chuckling over their so-called “waterfalls” and

214 Regis, *Great Mambo Chicken*.

215 Davis, “Stanford Torus.”

“natural” rock formations of concrete.”²¹⁶ But, Heppenheimer went on, it’s better than the inside of a greyhound bus – just like the suburbs weren’t the sublime, but they were better than the inner city. Perhaps the essential problem was that in order to live in space, colonists needed to bring technology with them, enough technology that the environment around them didn’t look like what they thought nature should look like anymore. Despite the claim that a Frontier should be a total *tabula rasa*, we do have various preconceptions about what life on a Frontier should look like: we should be able to practice agriculture there like our forefathers did, it should be a place abundant in natural resources, it should enable a particular idyllic aesthetic of Frontier life. The L-5 Society discovered that they needed to use technology to make the technology required for their life in space not feel like technology. Even the old west needed it’s irrigation to turn it into the amber waves of grain promised by Jeffersonian democracy. Despite Heppenheimer’s initial claims that L-5 colonists would be “the people of space,” shaped by space in profound and fundamental ways which perhaps we cannot even understand, the reality was that most L-5 colonists wanted it the other way around – they wanted to transform space into the nature they were familiar with. By the end, L-5 members did not want to live in Space as a New West – they wanted to import the Old West into space.

Conclusions

Laying out his grand vision of the future of space colonization for *Chrysalis*, Isaac Asimov wrote of the “people of space,” a generation of colonists who grew up on the High Frontier, that “space becomes their highway, not their boundary.”²¹⁷ Asimov wrote these words with great optimism, describing a future where humans continue to push their way out into the cosmos, discovering new worlds, stars, and galaxies, new wonders untouched by human hands or even human eyes. But looking back on where L-5’s sociotechnical imaginary ended up by 1975, Asimov’s statement takes on a certain sad tenor. The idea of a highway that takes you to the next

²¹⁶ Heppenheimer, “A Strollin’ In the Astroturf.”

²¹⁷ Asimov, *Chrysalis*.

Frontier is very exciting – until you think of the physical reality of a highway as a place, and not a very pleasant place to live near. In fact, looking at most landscapes that have played the role of the Frontier in American history, many of them are mostly highway now, built at one point to take intrepid travelers out to the place where the highways end. In time, even these highways themselves become forgotten spaces – Route 66 used to be lined with bustling, glittering waystations to welcome travelers on their way to The West, but now, it’s increasingly ghost towns – just a few gas stations and McDonalds to serve the needs of the highway. Once Frontiers are settled and people move on, they become interstitial spaces, so mundane that they become forgotten, what Marc Augé would call a “Non-Place.”²¹⁸ Perhaps, Asimov’s quote, unintentionally, reveals a funny sort of collision between dreamscapes and actual landscapes, a fault line where dusty mundane realities brush up against lofty Frontier visions.

In the 70s, perhaps, space was not just a “culture medium,” but it was a medium for imagination, a medium of possibility, a medium capable of supporting and nourishing imaginary landscapes – utopian communities, mystical visions, strange possibilities of alien life and new forms of living – capable of holding many, sometimes contradictory, dreamscapes in it at once. It was at once a cosmic cornucopia of auroras, background radiation, vibes, and human possibility, and a dull, lifeless void, speckled with occasional unblinking stars. At once completely mystical and completely scientific. And, of course, home to a million diametrically opposed utopias.

In some ways, this non-contradiction was the real promise of outer space as a sociotechnical imaginary in the 70s. When the members of the L-5 Society talked about the “freedom” of space, all those glittering, independent, individual space colonies, they didn’t just mean freedom from social ties or from oppressive governments – they also meant freedom from contradiction, freedom from social friction – a place out in space where you’d never have to worry about disrupting your neighbor’s TV with your tesla coils. One of the real utopian promises of L-5 was the ability to never get into an argument with someone else over your way of life that you can’t resolve just by packing up and moving to L-4, or somewhere further still. Just as solar powered satellites made it so that the environmentalists would never need to butt heads with the industrialists, the L-5 Society had faith that space and futuristic technology would mean never having to choose between the financial comfort and political freedom, between

218 Marc Augé, “Non-Places: An Introduction to Anthropology of Supermodernity,” *Le Seuil*, 1992, Verso, p. 122.

technological living and nature, between individualism and collectivism. As a dreamscape, L-5 could hold all these contradictory desires at once – the places they clashed could be elided or hidden, except for the moments documented in this paper where run ins with real world policy or physics forced them to be uncovered. Perhaps, if it had ever been built and subjected to the harsh natural laws of the world, L-5 would have collapsed under its own weight, but in an ethereal, weightless realm, like space or imagination, impossible structures (as well as disbelief) can be suspended – if only for a little while.

What lessons can we take away from seeing the contradictory desires of the members of the L-5 Society laid out together in one fantastical landscape? First of all, the “suburbanization” of the imaginary landscape of the Final Frontier can perhaps provide us some insights into similar changes in the actual landscape of American in the 70s. In some ways, from 1975 to 1977, the dreamscape of L-5 underwent a process of colonization and suburbanization on fast-forward. The wilderness of space was gradually paved over, from untamed starry expanse to mining colony to frontier settlement to the Hilton Hotel in space – so why, if they initially went to space to escape Levittown houses and manicured lawns, was this the vision they settled on? While many Americans in the 60s and 70s declared suburbia to be the antithesis of the Frontier, there is also evidence that the two landscapes did have a funny sort of symbiosis, a symbiosis that Kenneth Jackson alludes to in the title of his work on the suburbs, *The Crabgrass Frontier*.²¹⁹ After all, the suburbs did start out as a sort of Frontier project, a place outside of the city where Americans could live in nature in a house built to their own specifications, with enough elbow room for self-determination.²²⁰ This was the vision behind early idealistic suburban projects, like Frank Lloyd Wright’s semi-utopian Usonia project.²²¹ And even into the 70s, these ideas apparently did hold some sway. In 1971, Time Magazine published a special issue on suburbia which contained an interesting contradiction: despite the fact that the suburbs were so universally decried in the media and trashed in public opinion polls, their population was still steadily increasing.²²² In fact, starting in the early 70s, a plurality of the population now lived in the

219 Jackson, *Crabgrass Frontier*.

220 Ibid, and Sugrue and Kruse, *New Suburban History*.

221 “Frank Lloyd Wright at 150: Unpacking the Archive” at *The Museum of Modern Art (MoMA)*, New York, June 12–October 1, 2017.

222 “Suburbia: A New Plurality,” *Time*.

suburbs.²²³ Their reasons for moving often did follow a version of the Frontier narrative – they wanted to get away from the industrial grime of the city, live somewhere where they could own a little plot of land all their own. In *The Me Decade*, his classic summing up of the dilemma of 1970s society, Tom Wolfe wrote about describing American living to an Italian audience.²²⁴ He reports that these Italian teenagers were amazed “that people so young [the hippies] could go off on their own, without taking jobs, and live a life completely of their own design—to Europeans it was astounding.” However, the Europeans saw very little different between the individualist narrative of these hippies, and the “ordinary factory workers [who] could go off to the suburbs and buy homes and create their own dream houses—this, too, was astounding.” Wolfe ultimately argues that the hippie dream of freedom and self determination was not all that different from the dream promised by the suburbs. Perhaps this unlikely correspondence is what the L-5 Society stumbled upon in the process of working out their conflicting collective desires for self-determination, which gradually shaped their mining colony into the swimming pool in space. Suburbia may not have been the dreamscape that anyone would admit to wanting, they did have a certain pull – there was evidently some kind of appealing compromise found there.

Secondly, despite the fact that many of the desires and hopes for space expressed by the L-5 Society were internally contradictory, it is important to note that, to the members of the L-5 Society, they were still all compelling things to want – and the fact that they were contradictory did not stop members of the counterculture and mainstream culture in the 70s alike from wanting all them. Many of the questions that the L-5 Society ran into in attempting to plan their colony were very difficult ones, and the necessity of suspending contradictions didn’t just come from the fact that different members of the society disagreed with each other, but from the fact that many individuals were themselves conflicted. Keith and Carolyn Henson were personally torn between the pragmatism of needing the government to fund a huge public works development, and wanting to live totally off the grid and self-sufficiently, and Heppenheimer did seriously want to experience the sublime beauty of outer space, and the sublime beauty of familiar earth nature. Many of the questions which needed to be sorted out in the sociotechnical imaginary of L-5 were not only the ones that caused fissures between the culture and counterculture, or left and right,

223 Ibid.

224 Tom Wolfe, “The Me Decade and the Third Great Awakening,” in *New York Magazine*, August 23, 1976.

but also ones that people across the board struggled with in the 70s – A desire for meaning and fulfillment, a desire for individual self expression but also to participate in the kind of structures that require mass human collaboration, a sense that neither the suburbs nor the inner city nor even the wild wilderness provided a satisfying lifestyle.

Bibliography

- Augé, Marc. "Non-Places: An Introduction to Anthropology of Supermodernity." *Le Seuil*, 1992, Verso, p. 122.
- Allen, Michael. "'I Just Want to Be a Cosmic Cowboy': Hippiers, Cowboy Code, and the Culture of a Counterculture," in *Western Historical Quarterly*, Vol. 36, No. 3 (Autumn, 2005), pp. 275-299.
- Brandt-Erichsen, David. "Brief History of the L5 Society" in *Ad Astra*, Nov.-Dec, 1994. <http://space.nss.org/brief-history-of-the-l5-society/>. Last accessed 12/13/2018.
- Barlow, John Perry. "A Declaration of the Independence of Cyberspace." Hosted on the *Electronic Frontier Foundation*, 1996. <https://www.eff.org/cyberspace-independence>. Last Accessed 5/9/2019.
- Cohen, Lizabeth. *A Consumer's Republic: The Politics of Mass Consumption in Post-War America*. New York Knopf: Distributed by Random House, 2003.
- Coleman, William. "Science and Symbol in the Turner Frontier Hypothesis" in *The American Historical Review*, Vol. 72, No. 1 (Oct., 1966), pp. 22-49.
- Cronon, William. "Revisiting the vanishing frontier: The legacy of Frederick Jackson Turner," in *The Western Historical Quarterly*, 18.2 (1987): 157-176.
- Faragher, John Mack. "The frontier trail: Rethinking Turner and reimagining the American West." (1993): 106-117.
- Geppert, Alexander C. T, ed. *Limiting Outer Space: Astroculture After Apollo*. London: Palgrave MacMillan, 2018.
- Hein, Thomas. *The Great Funk: Falling Apart and Coming Together (On a Shag Rug) In the Seventies*. Farrar, Straus and Giroux, 2007.
- Hersch, Matthew. *Inventing the American Astronaut*. New York: Palgrave Macmillan, 2012.
- Hofstadter, Richard. "Turner and the Frontier Myth," in *The American Scholar*, Vol. 18, No. 4 (AUTUMN 1949), pp. 433-443.
- Jackson, Kenneth. *The Crabgrass Frontier: The Suburbanization of The United States*. New York: Oxford University Press, 1985.

- Jassanov, Sheila and Sang-Hyun Kim, ed. *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago; London: The University of Chicago Press, 2015.
- Kaiser, David and Patrick McCray. *Groovy science : knowledge, innovation, and American counterculture*. Chicago; London: The University of Chicago Press, 2016.
- Kaiser, David. *How the Hippies Saved Physics: Science, Counterculture, and the Quantum Revival*. New York : W.W. Norton & Co., 2012.
- Kaiser, David. "The Post-War Suburbanization of American Physics," in *American Quarterly* 56, 2004, 851–888.
- Kirk, Andrew. "Appropriating Technology: The Whole Earth Catalog and Counterculture Environmental Politics", *Environmental History*, Vol. 6, No. 3 (Jul., 2001), pp. 374-394.
- Kruger, Ted. "Mediated Perception: Towards and Experience of Extreme Environments," in *Mutamorphosis Conference Proceedings*, Feb 3rd, 2003.
<https://mutamorphosis.wordpress.com/2009/03/02/mediated-perception-towards-an-experience-of-extreme-environments/>. Last accessed 4/9/2018.
- L-5 News, September 1975 to January 1978, archived by David Brandt-Erichsen.
<https://space.nss.org/l5-news/>.
- Lamar, Howard R. "Persistent Frontier: The West in the Twentieth Century," in *Western Historical Quarterly*, 4, January 1973.
- Leary, Timothy. *Neurocomic*. Last Gasp Eco-Funnies: 1976.
- Mann, Ralph. "Frontier Opportunity and the New Social History," in *Pacific Historical Review*, 53, November 1984.
- Marx, Leo. *The Machine in the Garden: technology and the pastoral ideal in America*. New York: Oxford University Press, 2000.
- McCray, Patrick. *The Visioneers: How A Group of Elite Scientists Pursued Space Colonies, Nanotechnologies, and a Limitless Future*. Princeton: Princeton University Press, 2013.
- Michaud, Michael A. G. *Reaching For The High Frontier: The American Pro-Space Movement 1972-1984*. <http://space.nss.org/reaching-for-the-high-frontier-the-american-pro-space-movement-1972-84/>. Last accessed 12/13/2018.
- Mindell, David A. *Digital Apollo: Human and Machine in Spaceflight*. Cambridge, Mass; London : MIT Press, 2011.

- Mirzoeff, Nicholas. *How To See The World*. London: Pelican, 2015.
- O'Neill, Gerard. *The High Frontier: Human Colonies in Space*. New York: Morrow, 1976.
- O'Neill, Gerard, et al. *Space-based manufacturing from nonterrestrial materials : technical papers derived from the 1976 summer study at NASA Ames Research Center, Moffett Field, California*. New York: American Institute of Aeronautics and Astronautics, 1977.
- Regis, Ed. *Great Mambo Chicken and the Transhumanist Condition*. Reading, Mass: Addison-Wesley Pub. Co., 1993.
- Smith, Michael G. *Rockets and Revolution: A Cultural History of Early Spaceflight*. Lincoln : University of Nebraska Press, 2014.
- Sugrue, Thomas and Kevin Kruse. *The New Suburban History*. Chicago : University of Chicago Press, 2006.
- Tribbe, Matthew D. *No Requiem For the Space Age: The Apollo Moon Landings and American Culture*. Oxford: New York; Oxford University Press, 2014.
- Turner, Fred. "Don't Be Evil: Fred Turner on Utopias, Frontier, and Brogrammers." *Logic #3*, 2018. <https://logicmag.io/03-dont-be-evil/>. Last accessed 4/9/2019.
- Turner, Fred. *From counterculture to cyberculture: Stewart Brand, the Whole Earth Network, and the rise of digital utopianism*. Chicago: University of Chicago Press, 2006.
- Turner, Fredrick Jackson. "The Significance of the Frontier in American History," in *The Frontier In American History*. Tucson: University of Arizona Press, 1986
- Unknown author. "Home on Lagrange," in *The New England Science Fiction Association Filk Hymnal*. Cambridge, MA: New England Science Fiction Association, 1990.
- Various authors. "Chrysalis: A Community in Space," in *Space World*, 1977.
- Various authors. "Suburbia: The New American Plurality," in *Time Magazine*, March 15th, 1971, Vol. 97 No. 11.
- Valentine, David, Valerie A. Olson, Debbora Battaglia. "Extreme: Limits and Horizons in the Once and Future Cosmos," in *Anthropological Quarterly*, Volume 85, Number 4, Fall 2012, pp. 1007-1026.
- Wolfe, Tom. "The Me Decade and the Third Great Awakening," in *New York Magazine*, August 23, 1976.

Wolfe, Tom. *The Right Stuff*. New York: Picador, 1978.

Young, M. Jane "'Pity the Indians of Outer Space': Native American Views of the Space Program" in *Western Folklore*, Vol. 46, No. 4 (Oct., 1987), pp. 269-279.