

Another Life, Another World: The Spiritual Origins of Spaceflight

by

Ryan Snopek

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

This work reassesses the origins of the idea of humanity's destiny in outer space, examining the development of popular enthusiasm about extraterrestrial life and reincarnation in Europe and America from the early nineteenth century to the early twentieth century. It connects popular interest in the afterlife to transcendental and spiritualistic perceptions of outer space, which originated as mystical and theological ideas which over the course of the nineteenth century became increasingly secular and scientific. The result was a utopian view of humanity's future on other planets, one which transformed from the spiritual to the physical and inspired early rocket pioneers to seriously theorize and advocate for spaceflight, leading to the ultimate achievement of this goal in the 1960s.

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It seems like a dream that this journey has finally come to an end. I could not have completed it without my advisor, the irreplaceable Alexander Statiev: his scholarly insight and his font of incredible life stories have made him a truly great and memorable teacher. Through all the turmoil of the past two years, he believed I could accomplish something great. And, as with everything beautiful and bright in this world, I must thank my fiancée, Lilya: without the love and companionship of her and our beloved cat Jadzia, all of this may have never come to be. With the gift of a certain book one Christmas, she set me on this path.

Dedication

I dedicate this work to all those who have dreamed of and striven for a better and more beautiful world, but never lived to see it. If there is any truth to cosmism, then may they yet live another life without fear of suffering or sorrow.

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Introduction

Citizens, the nineteenth century is great, but the twentieth century will be happy. Then there will be nothing left of the old history; there will be no more fear, like there is today... You could almost say: There will be no more events. People will be happy. The human race will live up to its law, just as the terrestrial globe lives up to its law; harmony will be reestablished between the soul and the star.

Victor Hugo, *Les Miserables*¹

It is nearly impossible today to envision a future for humanity that does not somehow involve outer space. Across contemporary media from technical histories to children’s literature, outer space is posited as the natural destiny of mankind.² Space is the final frontier, where heroic explorers will discover new worlds, and new life with them. Looking backward from accomplishments like the first humans in space and on the Moon, a cosmic humanity only seems like the logical result of millennia of progress.

This is how traditional and official narratives of the quest for outer space have put it, and naturally much of this is written in hindsight: historians of spaceflight have looked for immediate predecessors and prophets, who described spaceflight as we presently know it. In his article “Compelling Rationales for Spaceflight?” the preeminent scholar of space and the American space program Roger D. Launius enumerated five “rationales” for spaceflight, broad concepts that he believed were the primary motivations of both policy and interest regarding missions beyond Earth:

- 1) Human destiny/survival of the species.
- 2) Geopolitics/national pride and prestige.
- 3) National security and military applications.
- 4) Economic competitiveness and satellite applications.
- 5) Scientific discovery and understanding.³

1 Victor Hugo, *Les Miserables*, trans. Julie Rose (New York: The Modern Library, 2008) Part 5, Book 1, Chapter V.

2 For this kind of technological narrative about rockets, see David Baker, *The History of Manned Space Flight* (New York: Crown Publishers, 1981), 8–9; For an example from modern popular science for children, see Don Nardo, *Destined For Space: Our Story of Exploration* (North Mankato, Minnesota: Capstone Press / Smithsonian, 2012).

3 Roger D. Launius, “Compelling Rationales for Spaceflight? History and the Search for Relevance,” in *Critical Issues in the History of Spaceflight* (Washington, D.C.: National Aeronautics and Space Administration, 2006), 44.

While these may be true, as Launius frames it, in the post-Sputnik era, they fundamentally miss the original motivations for popular fascination with outer space. For one, Launius completely neglects to mention the question of extraterrestrial life: today, as in the nineteenth century, this question constantly inspires the imagination of many when envisioning a cosmic future for humanity. Additionally, many of the rationales he lists were utterly nonexistent during the formative period of spaceflight interest: popular astronomers, philosophers, and the public were not thinking of the national prestige of spaceflight programs, nor did they think of it in terms of international economic competition or national security interests. Indeed, the way most people thinking about space imagined it had very little indeed to do with real science, even as they framed and clothed their arguments with scientifically-inspired language and ideas. The one rationale that nineteenth-century people would have identified with out of Launius' list is the first that he lists, even as he states that the idea of human destiny in outer space has always been implicitly, not explicitly, utopian: this is quite unlike how it was seen in Victorian times.

In the same anthology of papers on spaceflight, professor of public affairs and space policy Howard E. McCurdy writes that “The vision of human spaceflight is a familiar one. It begins with brave souls venturing in small ships through difficult substance to distant lands.”⁴ Even more recent scholars who emphasize other motivations behind spaceflight in the mid-twentieth century, like Catherine L. Newell in *Destined For the Stars* about the American religious perception of space, reinforce the now-ubiquitous association of space exploration with the “final frontier.”⁵ The American colonial frontier has, since the Space Age, intentionally been linked with the space program: Wernher von Braun, leader of the American mission to the Moon, said that space “was a new physical and

4 Howard E. McCurdy, “Observations on the Robotic versus Human Issue in Spaceflight,” in *Critical Issues in the History of Spaceflight* (Washington, D.C.: National Aeronautics and Space Administration, 2006), 80.

5 Catherine L. Newell, *Destined for the Stars: Faith, the Future, and America's Final Frontier* (Pittsburgh: University of Pittsburgh Press, 2019).

scientific frontier, and its mysteries captured the imagination of a pioneering people.”⁶ These narratives, however, omit that such “imagination” in large part involved belief in extraterrestrial beings on other planets, and even interplanetary life after death. McCurdy, like other writers, makes the apparently natural comparison between American frontier pioneers and the human future in outer space. In contrast, he suggests that initiatives like the Search for Extraterrestrial Intelligence of the 1970s, which emphasized communication with other species in the cosmos over direct human and robotic missions, failed because it departed too drastically from this traditional understanding of space exploration.⁷ He foresees the eventual evaporation of public interest in spaceflight for similar reasons:

Ultimately, the human spaceflight vision will disappear because it is an old vision, tied to past events that become more distant with each succeeding generation. The space-faring vision helped people standing at the midpoint of the 20th century express their loss at the passing of the heroic age of terrestrial exploration. Such nostalgia is likely to hold less appeal as new generations and developments emerge.⁸

This all reflects both a remarkable pessimism and determinism surrounding the nature of human spaceflight, perhaps characteristic of the early twenty-first century after the 2003 *Columbia* disaster dampened public and national enthusiasm for space missions. These thinkers became too invested in a narrow view of why spaceflight emerged in human thought and history, and when they perceived this singular vision as fading into the past, it seemed as though the quest for humanity in outer space would fade away with it. This perception ends up becoming blinded to the very real – if, from a modern perspective, very strange – reasons why people in Europe and America became enthralled by the idea of a cosmic human future in the first place.

There is one exception to this narrative: Russian cosmism and the Soviet space program. In popular accounts of the Cold War space race, the Soviet approach to space is delineated from an

6 Wernher Von Braun, “Dr. Wernher von Braun’s Speech from the National Press Club’s Reception for the Tenth Anniversary of Explorer I” (Speech, Tenth Anniversary of Explorer I, Washington, D.C., January 31, 1968), 2, https://explorer1.jpl.nasa.gov/explore-as-one/downloads/pdf/von_Braun.pdf.

7 McCurdy, “Observations on the Robotic versus Human Issue in Spaceflight,” 98–97.

8 McCurdy, 86.

American approach: while American motivations, as Launius and von Braun describe it, emphasized the very materialistic rationales of frontier exploration and technological progress, the Soviet motivation was grounded in the esoteric spiritualism of a philosophy known as Russian cosmism, created by Nikolai Fyodorov in the nineteenth century.⁹

In truth, Russian cosmism was not alone or original in offering a spiritual justification for space travel. In the nineteenth century, outer space in the popular imagination was richly populated with ideas about extraterrestrial life and cosmic resurrection. These ideas, originating in Christian theology and mysticism, intermingled with science, socialism, and utopianism to create, by the beginning of the twentieth century, a society in Europe and America that believed in imminent contact with life on other worlds and human future lives on other planets.

This is the first work of history to place the idea of space travel into a historical intellectual context, connecting the threads of the technological achievement of spaceflight in the middle of the twentieth century to its popular origins and motivations in the nineteenth century.

In the following chapters, I will explain the older current of mystical and spiritual thought that not only created a huge swell of popular interest in humanity's place in the cosmos, but also directly inspired the early rocket pioneers in their collective quest to realize human spaceflight. This initially theological line of thought changed form over the course of the nineteenth century to take on more scientific characteristics and justifications, while the key concepts of life on other worlds and reincarnation in outer space remained intact. By the Space Age, the new technological and exploratory narrative justifying spaceflight took over, as national governments and militaries became involved in it on a large scale.

9 Benjamin Ramm, "Cosmism: Russia's Religion for the Rocket Age," News, BBC Future, April 20, 2021, <https://www.bbc.com/future/article/20210420-cosmism-russias-religion-for-the-rocket-age>; A similar perception of Russian cosmism is expressed in this interview with space historian Albert Harrison, see Albert Harrison, *The Holy Cosmos: The New Religion of Space Exploration*, interview by Ross Andersen, March 29, 2012, <https://www.theatlantic.com/technology/archive/2012/03/the-holy-cosmos-the-new-religion-of-space-exploration/255136/>.

The first chapter will explore the concept of extraterrestrial life and how it developed as a popular idea through to the end of the nineteenth century. Although previous Greek, Roman, and Arab thinkers had considered the idea of life on other worlds, they were fundamentally restrained by Ptolemaic and Aristotelian conceptions of heavenly spheres and a geocentric universe, preventing them from seeing other planets as physical relatives of Earth, or other stars as hosts of solar systems. After the Copernican Revolution in early modern Europe, as well as the discovery of Jupiter's moons by Galileo, philosophers and astronomers quickly began to theorize that God had created life on other worlds similar to our own. Some even imagined fantastical and mythological forms of flight to the Moon – on the backs of birds, attached to fireworks, or on flying chariots.

By the early nineteenth century there is an explosion of not just philosophical but popular interest in extraterrestrial life, with new American religious sects like Mormonism making it part of their doctrine. Themes of astronomy and life on other worlds were well-known enough by the public that a hoax published in 1835 purporting to announce the discovery of the Moon's inhabitants achieved overwhelming success across Europe and America, with many taking it as truth.

The second part of the first chapter follows on from this by examining in detail the most sensational and intense period of popular interest in extraterrestrial life: the Mars craze of the 1870s-1920s, spurred on by near-ubiquitous acceptance of a Martian civilization and technological advancements like the radio. By the beginning of the twentieth century life on Mars, despite there being no physical evidence of Martian inhabitants, was written about in the *New York Times* and *Wall Street Journal* as veritable scientific truth; few if any arguments remained using Biblical scripture or appeals to Christian creation.

The second chapter, in two parts, will follow the parallel evolution of spiritualist and utopian ideas in America and France, respectively, focusing on two core ideas: communication with the dead, and reincarnation. Emanuel Swedenborg, a Swedish scientist and mystic, initially wrote about both of

these ideas in the middle of the eighteenth century in a purely theological sense; by the early twentieth century, these core ideas had transformed from the theological to the scientific, offering a highly popular explanation for where the human consciousness went after death and the tantalizing possibility of contacting deceased loved ones. While American intellectual currents initially separated belief in reincarnation from outer space and communication with the dead, these ideas became explicitly connected by the end of the nineteenth century. This owed to the influence of the most influential popular astronomer of the time, Camille Flammarion, who persuasively intertwined exciting astronomical theories with ideas of reincarnation and spiritual communication derived from earlier French socialists. His works definitively set the standard for popular belief about outer space into the 1920s. This is reflected in various forms throughout contemporary literature, from American science fiction to French spiritism to Russian cosmism, all of which share their intellectual roots in Swedenborg.

The third and final chapter will combine the ideas of the preceding two through four personalities who pioneered rocketry and made space travel a reality: Konstantin Tsiolkovsky, Robert Goddard, Hermann Oberth, and Wernher von Braun. Although the official narratives surrounding their motivations shifted, less well-known writings from throughout their lives reveal a close association with the same spiritualistic and occult ideas popular around the turn of the century.

As with Victor Hugo, outer space in the imagination of people in the nineteenth century reflected utopian visions of a twentieth century that had advanced technologically, socially, and morally. To this end they utilized their common knowledge of emerging scientific theories as well as astronomical discoveries, combined with Christian mysticism and new spiritualist movements. Even scientific theories that are outmoded today, like racial science and the doctrine of progress, were used to argue that humanity had a more perfect and harmonious future in the cosmos. By the time a rocket

actually took a man into orbit in 1961, most of these ideas had been transformed from spiritual and immaterial to scientific and technological.

This created a society, from America to Russia, that had a collective imagination of humanity not as inhabitants of one mere globe but citizens of a vast and yet-undiscovered country, full of fellow-spirits like themselves who would welcome their ascension into the next stage of human evolution. Just the same, philosophical and intellectual currents of the mid-twentieth century reflected a conscious detachment from these earlier ideas, in favour of secular science divested of any occultism or supernatural thought, in which general scientific discovery and materialistic exploration formed the primary motivations for space exploration.

In the present day, space has once again exploded in popularity and public interest, with manned missions to the Moon and even Mars back on the table, to say nothing of the looming rise of low-Earth-orbit industry. “Rocket” is a respectable word today, unlike in the middle of the twentieth century, and perhaps we can look also to the fundamental ideas of a better, more egalitarian and prosperous future in space that emerged in the public mind of the nineteenth century. Here follows an account of how we first began to imagine ourselves as a society and species beyond Earth.

Chapter 1.1: Seeking New Life and New Civilizations

*Hesper—Venus—were we native to that splendour or in Mars,
We should see the Globe we groan in, fairest of their evening stars.
Could we dream of wars and carnage, craft and madness, lust and spite,
Roaring London, raving Paris, in that point of peaceful light?
Might we not in glancing heavenward on a star so silver-fair,
Yearn, and clasp the hands and murmur, 'Would to God that we were there'?*
Alfred Lord Tennyson, *Locksley Hall Sixty Years After*.¹⁰

The question of extraterrestrial intelligence was one of the most enduringly popular topics of the nineteenth century. It began with theological arguments, left over from the Copernican revolution that stripped Earth of its central place in the universe, about whether the Christian conception of God allowed for other rational beings on other worlds. Combined with advances in astronomy at a time when scientists and theologians argued for or against extraterrestrial intelligences, this topic entered the mainstream in both serious and satirical works aimed for the first time at the public. Many popular figures, ranging from artists like Alfred Tennyson to scientists like John and William Herschel, commented on and wrote about extraterrestrial life, and it grew to capture the imagination and opinions of ordinary people, in a very similar manner to Darwin's contemporary theory of evolution. In a way, it was popular *because* there was a debate.

This dispersion of discourse, from the elite to the everyday, marks a sharp departure from earlier discussion on outer space, and is crucial to the roots of spaceflight. In other words, in order to get a better sense of how nineteenth-century Europeans thought about outer space, we must examine the main way they talked about it: through the framework of life beyond Earth.

This chapter will first chart the evolution of this idea, known at the time as the “plurality of worlds,” from its theological origins in the seventeenth century to its scientific transformation in the

¹⁰ Alfred Lord Tennyson, “Locksley Hall Sixty Years After,” in *Ballads and Other Poems*, ed. Hallam Lord Tennyson, *The Works of Tennyson*, VI (London: Macmillan, 1908), ll. 187–192.

nineteenth. Although the justifications and arguments for extraterrestrial life changed vastly in the nineteenth century, the core idea was retained completely intact: Earth is not the only abode of life, and other planets have also developed intelligent, civilized inhabitants who resemble ourselves. The second section of this chapter is a case study of the most active period of popular interest in extraterrestrial life: the Mars craze of the late nineteenth- and early twentieth centuries, in which people across the globe were assured of imminent contact with intelligent beings on Mars.

Perhaps the first clear mention of extraterrestrial life in European thought emerges from the second century AD novel *A True Story* by Lucian of Samosata. This story, like many others that followed it on the same theme, is a satire on the author's society as well as on fantastical tales of faraway lands. Astronomy was a discipline already some three thousand years old by the time of the telescope, and though the Greeks and Romans considered the idea of life on other worlds, the scientific treatises of Ptolemy and Aristotle, which dominated European and Islamic astronomical thought for nearly two millennia, precluded a full understanding of the nature of the solar system.¹¹ The heavens, divided into a series of spheres, all ranked below Earth, the heart of life in the known universe. The stars and planets shined for the benefit of mankind, placed there in the firmament by God.

The sixteenth-century writings of Nicolaus Copernicus upended this classical geocentric model of the universe and advanced the principle of mediocrity: that our planet is not special in the universe, and that other celestial bodies can be expected to be more or less like Earth.¹² His heliocentric model of the universe sparked newfound interest in extraterrestrial life and adventure, and opened the intellectual door to countless cosmic possibilities. Several crucial assumptions arose in European philosophy and especially Christian theology as a result: that we can understand other planets by looking at conditions on the Earth; that all worlds, not just our own, were created by God; that these worlds therefore must

11 Michael J. Crowe, ed., *The Extraterrestrial Life Debate, Antiquity to 1915* (Notre Dame, Indiana: University of Notre Dame Press, 2008), 3–5.

12 George Basalla, *Civilized Life in the Universe: Scientists On Intelligent Extraterrestrials* (Oxford: Oxford University Press, 2006), 9.

harbour intelligent, rational beings like ourselves; and that these beings beyond Earth must, like angels and heavenly spirits, be more perfect than terrestrial human beings and therefore more philosophically, technologically, and morally advanced.¹³

Although the Catholic Church deemed it heresy and punished its proponents severely, the Copernican principle did not diminish God's greatness in the eyes of many seventeenth-century thinkers: rather, it enhanced it. They knew well that "the heavens declare the glory of God; the skies proclaim the work of His hands" (Psalm 19:1, NIV), and it was intuitive that, if there are other worlds out there, they must be similarly crafted by God's unlimited creative power. Astronomy, then, was a way to better understand and appreciate Creation – it was arguably blasphemous to argue against extraterrestrial intelligence and thus limit what He could do.¹⁴

The British minister and popular science writer Thomas Dick in 1838 wrote a book that adeptly summarized the aforementioned assumptions that founded Christian belief in extraterrestrial intelligence. This book, *Celestial Scenery*, ends with a section outlining the main arguments for the plurality of worlds from a Christian perspective.

First he quotes Isaiah 45:18, on the creation of the heavens and the Earth, that "He created it not in vain; He formed it to be inhabited."¹⁵ By this line of thinking, it went against God's perfection to imagine barren, lifeless worlds: they were made for the enrichment of their intelligent inhabitants, and by definition God would not make empty waste. This was intensely exciting and offered immense opportunity: by Dick's calculations, based on the surface area of the various celestial bodies of our solar system (including the Sun), our neighbourhood numbered 21,895,000,000,000 souls.¹⁶ This was not an outrageous thought for the time: one of the most respected astronomers in history, William

13 Basalla, 9, 13, 25; Crowe, *The Extraterrestrial Life Debate*, 36–37.

14 Basalla, *Civilized Life in the Universe*, 8.

15 Thomas Dick, *Celestial Scenery; or, The Wonders of the Planetary System Displayed: Illustrating the Perfections of Deity and a Plurality of Worlds*, vol. 7 (Philadelphia: Edward C. Biddle, 1845), 333.

16 Dick, 7:333.

Herschel, offered scientific arguments for the habitability of the Sun in 1795; at that point, it was a foregone conclusion that the other planets bore life.¹⁷

Second, Dick observes that the other planets in the sky are broadly similar to the Earth: they are round, they have predictable rotations on an axis and an orbit around the Sun, and they are all (by the knowledge of the time) solid and material.¹⁸ For all that could be seen about them through a telescope, the other planets like Earth had seasons, sunlight, and atmospheres and it was a reasonable assumption to believe that they featured life as well.¹⁹

His final statement on extraterrestrial life stresses that life on other worlds may not resemble life on our own: the other planets have different sizes, surfaces, atmospheres, orbital periods, and densities. All worlds are created for their own inhabitants, who are adapted to conditions there no matter how alien it may make them to our own experience: “we cannot pretend to explore *all the ends or designs* which God may have had in view in the formation of any one object or department of the universe.”²⁰ This, too, was advocated by Herschel. In the wake of the discovery of new worlds across the sea with their own strange, exotic animals, plants, and cultures it was easy for Europeans to imagine new worlds in the sky where life was similar but different in relation to their own.²¹

Despite colossal shifts in thinking from the early seventeenth century to the present, these assumptions about extraterrestrial intelligence have remained largely intact and, just as importantly, are now as then held on faith: we have no reliable, conclusive evidence for other habitable planets in the universe, let alone other intelligent, technological life forms. Outer space emerged in the seventeenth

17 William Herschel, “On the Nature and Construction of the Sun and Fixed Stars,” *Philosophical Transactions of the Royal Society of London* 85, no. 85 (1795): 63.

18 Dick, *Celestial Scenery; or, The Wonders of the Planetary System Displayed: Illustrating the Perfections of Deity and a Plurality of Worlds*, 7:336–39.

19 Dick, 7:344–45.

20 Dick, 7:349.

21 Basalla, *Civilized Life in the Universe*, 40.

century as a popular literary space for philosophical musings and comical satire, a kind of early science fiction by the standards of pre-Newtonian scientific knowledge.

The four most notable examples from this early “Space Age” after Copernicus come from Johannes Kepler, Francis Godwin, John Wilkins, and Cyrano de Bergerac, who together over a span of just twenty years wrote detailed stories about spaceflight and extraterrestrial life.

By modern standards, these tales of interplanetary adventure are decidedly fantastical: Newtonian gravity and the distance of the Moon were not yet calculated and so could not put a realistic damper on imaginative voyages beyond Earth. In the intellectual and political climate of the seventeenth century, with European explorers coming back with incredible tales of the New World and other lands, flying to the Moon was thematically appropriate, popularly interesting, and not far-fetched; the Moon had yet to be plucked from Earth’s sky into the distant vacuum of space. It was thus not beyond reason that, just as the New World was found in recent history after a long journey across the sea, so too could the Moon be reached by equally adventurous Europeans someday as well.

Kepler’s *Somnium*, published posthumously in 1634, began the trend of Moon travel in the form of a dream. This journey of fifty thousand miles (about 1/5 the actual distance) is accomplished with the aid of demons who live on the Moon, who warn that the path is dangerous to humans though it takes only four hours for transit.²² Kepler describes the demonic moon-shot as exposing the body to extreme cold and little oxygen, an idea understandably gathered from experiences up on high mountains, though curiously Kepler also explains that the demon’s speed affects the human body in a way comparable to what we know as g-force and gives an analogue of a shot from a gun.²³

In his personal letters and published work, Kepler advocated for the existence of intelligent life on the Moon, and introduced the assumption that other worlds would necessarily mirror the Earth. For

22 Johannes Kepler, *Kepler’s Somnium: The Dream, Or Posthumous Work on Lunar Astronomy*, trans. Edward Rosen (Madison, Wisconsin: University of Wisconsin Press, 1967), 15.

23 Kepler, 16–17.

him and others it was a paradigm shift to discover that Jupiter had its own moons invisible to the terrestrial eye: writing to Galileo he remarked,

There are in fact four planets revolving around Jupiter at different distances with unequal periods. For whose sake, the question arises, if there are no people on Jupiter to behold this wonderfully varied display with their own eyes? For, as far as we on the earth are concerned, I do not know by what arguments I may be persuaded to believe that these planets minister chiefly to us, who never see them.²⁴

Not knowing that the Moon and planets are separate from the terrestrial sky and atmosphere, Kepler supposed that “ships or sails adapted to the breezes of heaven” will eventually enable human settlers to visit the people of these other worlds, who presumably are like us.²⁵ In his *Somnium*, he compares the Moon’s landscape to Earth’s “cantons, towns, and gardens... open country, forests, and deserts.”²⁶ This reflected the world he lived in and the world he knew. In particular, Kepler was certain that what we know of today as impact craters on the Moon’s surface were, in fact, lunar versions of the great technological achievements of his day: walled towns and forts, built on the models of da Vinci and Brunelleschi, built with technical precision and on an immense scale such as to be seen from the Earth.²⁷ Kepler himself grew up in landscapes and townscapes quite like the ones he describes in *Somnium* and his letters, and experienced the engineering marvel of modern fortifications first-hand when the city of Linz in Austria where he resided was besieged by a peasant army. Galileo, too, compared the largest lunar crater he saw to the terrain of Bohemia in Central Europe.²⁸

Four years later, the English bishop Francis Godwin wrote a similar story, deliberately placing his *The Man in the Moone* in the framework of the famous exploratory voyages of the Spanish and

24 Johannes Kepler, *Kepler’s Conversation with Galileo’s Sidereal Messenger*, trans. Edward Rosen, *The Sources of Science* 5 (New York and London: Johnson Reprint Corporation, 1965), 40.

25 Kepler, 39.

26 Kepler, *Kepler’s Somnium: The Dream, Or Posthumous Work on Lunar Astronomy*, 28; Basalla, *Civilized Life in the Universe*, 26.

27 Basalla, *Civilized Life in the Universe*, 26.

28 Galileo Galilei, *The Sidereal Messenger of Galileo Galilei, and a Part of the Preface to Kepler’s Dioptrics, Containing the Original Account of Galileo’s Astronomical Discoveries.*, trans. Edward Stafford Carlos (London: Rivingtons, 1880), 21, https://tile.loc.gov/storage-services/public/gdcmassbookdig/siderealmessenge00gali_0/siderealmessenge00gali_0.pdf; While Galileo himself was uninterested in the question of extraterrestrial life, he did feel it was philosophically worthwhile to ponder: Galilei, 81.

Portuguese. Perhaps owing to his clerical background, Godwin eschews Kepler's demonic explanation for spaceflight and extraterrestrial life and instead takes inspiration from nature: his pseudonymous protagonist Domingo Gonsales reaches the Moon by strapping several fictional giant geese to a device he constructs on the island of Saint Helena, requiring twelve days for his lunar journey.²⁹ He made use of the common European perception of bird migration to establish his spaceflight narrative: as he supposed, although a magnetic force keeps terrestrial creatures affixed to Earth, birds know a special path to the Moon that they use in the autumn and winter.³⁰

Godwin's Moon is covered in seas – the darker regions of the Moon as seen through a telescope – with plateaus and mountains featuring vast forests, and all flora and fauna he estimates as 10-30 times as large as their terrestrial counterparts.³¹ His account of lunar life is far more detailed than Kepler's, and he explicitly describes the utopian inhabitants, who resemble humans only in their humanoid stature and intelligence but live in beautiful cities, have a perfectly just world monarchy that has existed for 3077 years, live for a millennium, and revere Jesus Christ.³² In this way his story united the most modern astronomical knowledge with common tropes and ideas of exotic cultures dating back to Herodotus.³³

Owing to the exciting adventure narrative and vivid descriptions of lunar life, *The Man in the Moone* was incredibly popular and influential in its day, and established ideas about extraterrestrial life that persisted for centuries.³⁴

A Discovery of a New World, published also in 1638 with further editions up to at least a fourth by 1684, built upon Godwin's ideas but as an astronomical treatise. Written by another English bishop, John Wilkins, it argues that the Moon is habitable, that a passage exists to reach it, and that exploration

29 Francis Godwin, *The Man in the Moone*, ed. William Poole (Peterborough, Ontario: Broadview Press, 2009), 79, 98.

30 Godwin, 87–89.

31 Godwin, 96, 99.

32 Godwin, 100–103.

33 See editor's footnote 1 in Godwin, 103.

34 Godwin, 7–8.

of the Moon is as reasonable and far more profitable than equivalent expeditions to the New World. Where Godwin dwelled upon the nature and character of life on the Moon, Wilkins was concerned with the journey there. He references Godwin and adds his own classical inspiration, describing bird-powered chariots and the Icarian wings of Daedalus as methods by which to reach the Moon, which he agrees with Godwin is the place where birds must fly for winter.³⁵ Uniquely among his contemporaries and possibly the first example of this in history, Wilkins goes as far as to expressly advocate for spaceflight, explaining that

For besides the strange discoveries that it might occasion in this other World, it would be also of inconceivable advantage for Travelling, above any other Conveiance that is now in use. So that notwithstanding all these seeming impossibilities, tis likely enough, that there may be a means invented of Journeying to the Moon... In Brief, do but Consider the Pleasure and Profit, of those later Discoveries in *America*, and we must needs Conclude this to be Inconceivably beyond it.³⁶

Wilkins assumes that the people of the Moon must, like those on Earth, have art, religion, philosophy, and industry, but he recognizes that little can be known of them from Earthly observation.³⁷ In his writing he was interested chiefly in making an astronomical and theological argument for the existence of a habitable world on the Moon, and for an expedition to explore it and trade with its inhabitants to further the material goals of the English state.

The fourth in this series, and perhaps the best known today, is Cyrano de Bergerac's *The Other World: Comical History of the States and Empires of the Moon*, published in French in 1657. A ridiculous and satirical story by intent, it is nonetheless important because its content – a journey to the Moon and a description of its inhabitants – would have required its contemporary readers to be familiar with the current astronomical and theological conceptions of outer space; it built especially heavily on the ideas introduced by Godwin, who makes an appearance in *The Other World* as Domingo Gonsales.

35 John Wilkins, *A Discovery of a New World, or, A Discourse Tending to Prove, That 'tis Probably There May Be Another Habitable WORLD in the Moon*. (London: T. M. & J, 1684), 184–86.

36 Wilkins, 185, 187.

37 Wilkins, 143.

In this narrative, Cyrano de Bergerac builds a flying device to reach the Moon from New France, succeeding only when local soldiers celebrating St. John's Eve haphazardly attach fireworks to the machine.³⁸ His depiction of the Moon closely resembles that of Godwin, with massive seas and a stable atmosphere that leaves the whole world in a permanent springtime.³⁹ De Bergerac's Moon is in fact Eden, and the first man he encounters retells the story of Creation as the fall of lunar Man to Earth.⁴⁰ He placed his work intentionally in a series with Godwin and Wilkins, writing of "the Moon having been discovered, tho imperfectly, by others," these earlier writers being well-known to the later 1899 publisher of this particular reprint of de Bergerac's story.⁴¹

Many of these stories are purely fantastical in nature, because the concept of spaceflight soon began to face hard scientific barriers: in the latter half of the seventeenth century various scientists performed experiments using the barometer invented by Evangelista Torricelli in 1643, with Robert Boyle creating a vacuum with an air pump, and Blaise Pascal discovering that air pressure decreases as altitude increases.⁴² Further, in 1687 Isaac Newton formulated his new model of physics and determined that as bodies in motion stay in motion unless acted upon by an outside force (his First Law), outer space must consist of frictionless gravity lest the planets eventually grind to a halt.⁴³ This made it difficult to conceive of a method of reaching the Moon or other celestial bodies, as wings would no longer suffice and rockets, primitive and short-ranged through the eighteenth and nineteenth centuries, held little promise as devices to breach Earth's gravity. Newton's Third Law, that every action has an opposite reaction, later brought on a popular belief that rockets simply could not function

38 Cyrano de Bergerac, *A Voyage to the Moon*, trans. Archibald Lovell (New York: Doubleday & McClure Co., 1899), 38–39.

39 Bergerac, 47–48.

40 Bergerac, 55.

41 Bergerac, 3–4.

42 Gerald James Holton and Stephen G. Brush, *Physics, the Human Adventure: From Copernicus to Einstein and Beyond* (Rutgers University Press, 2001), 268; *The Jacobean Space Programme - Wings, Springs and Gunpowder: Flying to the Moon From 17th Century England*, Lecture (Gresham College, 2004), sec. 41:27, <https://www.gresham.ac.uk/watch-now/jacobean-space-programme-wings-springs-and-gunpowder-flying-moon>.

43 Isaac Newton, *Newton's Principia: The Mathematical Principles of Natural Philosophy*, trans. Andrew Motte (New York: Daniel Adee, 1846), 83.

in a vacuum, as they would have no atmosphere on which to push and achieve propulsion; this argument was regularly levied against rocketry pioneer Robert Goddard in the popular press when he announced his invention of a space-faring rocket.⁴⁴ The focus in both science and fiction shifted to observation and imagination rather than outright travel.

The debate over extraterrestrial life, however, continued and intensified into the eighteenth and nineteenth centuries. By the calculation of science historian Michael J. Crowe, at least 41% of authors featured in anthologies of Enlightenment texts engaged in this debate, including Voltaire, Descartes, Fontenelle, and Thomas Paine.⁴⁵ This was not merely a realm of fantasies: the idea of other worlds than ours offered a space for serious philosophical and theological consideration.

Given the problems Newtonian physics posed for spaceflight, it is reasonable to ask why, exactly, the conversation about extraterrestrial life became so popular afterward. The answer lies in how remarkably astronomically active the turn of the nineteenth century was in the eyes of the public. From the late eighteenth-century to around the middle of the nineteenth century the public was entranced by the discovery of new planets, anxiety and wonder surrounding comets, and the heavenly spectacle of massive meteor showers.

First among these events was the 1781 discovery of the planet Uranus by William Herschel, whose son John Herschel would play his own major role in nineteenth century astronomy. This, for the first time since antiquity, expanded the boundaries of the solar system and, implicitly, added to the habitable realms of the universe. This discovery not only brought Herschel a royal stipend for the rest of his life, it also catapulted him into the canon of great astronomers; he was famous enough that, for a time, Uranus – which he had titled *Georgius Sidus* after the British monarch – was instead known simply as Herschel after him. Sixty years later in 1846, the French astronomer Urbain Le Verrier used

44 Mark Williamson, *Spacecraft Technology: The Early Years* (London: Institution of Engineering and Technology, 2006), 13; Julian Harbis, “Rocket To Reach Moon? Hoax, Says French Scientist,” *New York Herald*, January 19, 1920; “Topics of the Times,” *New York Times*, January 18, 1920.

45 Crowe, *The Extraterrestrial Life Debate*, xvii–xviii.

mathematics to discover yet another planet, Neptune: the limits of God's creation were being continuously broadened by modern science.

The early nineteenth century also happened to mark a golden age of comet sightings, beginning with the Great Comet of 1811. One of the brightest and longest-visible comets in recorded history, the Great Comet was widely observed and regularly reported-on throughout the year: it makes appearances in Leo Tolstoy's *War and Peace* and Victor Hugo's *Les Miserables*, and started a trend of "comet vintages," particularly good wines coinciding with the year of a comet's passing.⁴⁶ The popularity of amateur comet-watching in 1811 can be seen in a print by Thomas Rowlandson from the same year, satirizing those who became so enamoured by the celestial world they paid no attention to earthly life around them.⁴⁷ This fascination with comets lasted for decades: Donati's comet in 1858, visible across much of Europe, inspired not only paintings but was also the subject of the first cometary photographs. It was so hotly anticipated that diagrams were published less than a week before the comet's arrival so that members of the public could find it in the sky.⁴⁸

In 1826 another comet captured public interest, though out of fear rather than awe: Biela's comet, observed and found to be periodic that year by German-Austrian astronomer Wilhelm von Biela. Astronomical calculations predicted that, in 1832, Biela's comet would intersect the orbit of the Earth, crashing into our planet and possibly ending all life.⁴⁹ Late eighteenth-century writers like French naturalist Georges Cuvier revealed to the public that there had been animals on Earth that lived before humans and had gone extinct: in other words, life on this planet was not guaranteed, and our

46 Rebekah Lusher, "Comet Culture," *Astronomy & Geophysics* 52, no. 5 (October 1, 2011): 5.16-5.17, <https://doi.org/10.1111/j.1468-4004.2011.52516.x>.

47 Thomas Rowlandson, *Looking at the Comet till You Get a Creak in the Neck*, 1811, Print, 392mm x 265mm, 1811, National Maritime Museum, Greenwich, London, <https://www.rmg.co.uk/collections/objects/rmgc-object-460864>.

48 Waller & Deacon, *Diagram of the Comet of 1858 Discovered by Donati, June 2nd.*, October 5, 1858, Print, 330 x 305 mm, October 5, 1858, National Maritime Museum, Greenwich, London, <https://www.rmg.co.uk/collections/objects/rmgc-object-242198>.

49 François Arago, *Tract on Comets: And Particularly on the Comet That Is to Intersect the Earth's Path in October, 1832* (Hilliard, Gray and Company, 1832), 47-48.

own species may face its extinction as well someday.⁵⁰ With this in mind, a cosmic threat like Biela's comet was taken deadly seriously, and the prominent astronomer Francois Arago wrote his *Tract on Comets* directed at the public to alleviate hysteria surrounding an imminent apocalypse.

As it happens the comet did not strike the Earth, but the idea of world destruction coming from outer space gripped the public imagination and remained a crucial part of popular thought around outer space into the twentieth century, reshaping how people thought about life on Earth as well as life on other worlds.⁵¹ An 1865 report in the *New York Times* on Biela's comet recalled "universal apprehension for the safety of our globe" back in 1832, and after the Great Fire of Chicago in 1871, wild theories emerged alleging that the fire was actually caused by the impact of Biela's comet.⁵² The sensationalism around cometary calamity inspired art, literature, and even comic songs like Henry Walker's *The Great Comet!*⁵³

Perhaps the most peculiar artifact to emerge from the excitement around Biela's comet was the Russian writer Vladimir Odoyevsky's *Year 4338*.⁵⁴ This short story, framed around the idea of the comet's return and destruction of the Earth 2500 years later, was Odoyevsky's *second* outing in the genre of cometary apocalypse science fiction. In 1825, ten years before *Year 4338*, he wrote *Two Days in the Life of the Terrestrial Globe*, a satire on Russian high society lacking the technological-utopian overtones of its spiritual successor.⁵⁵ *Year 4338* not only illustrated popular feelings about cometary

50 Thomas Moynihan, "The Intellectual Discovery of Human Extinction" (Doctor of Philosophy in English, Oxford, Oxford University, Oriel College, 2018), 88.

51 The topic of human extinction theory is a complicated one, and while it has bearing on the emergence of the concept of a human destiny in space, an excellent history of the idea can be found in Thomas Moynihan, *X-Risk: How Humanity Discovered Its Own Extinction* (Cambridge, Massachusetts: MIT Press, 2020).

52 "Biela's Comet.," *New York Times*, 1865; Robert Wood, "Did Biela's Comet Cause the Chicago and Midwest Fires?," in *2004 Planetary Defense Conference: Protecting Earth from Asteroids* (American Institute of Aeronautics and Astronautics), accessed August 27, 2022, <https://doi.org/10.2514/6.2004-1419>.

53 Henry Walker, "The Great Comet! A Fearful Tragedy Written under the Influence of Great Excitement" (B. Williams, 1835), Smithsonian Libraries.

54 Vladimir Odoyevsky, "The Year 4338. Letters from Petersburg," in *Pre-Revolutionary Russian Science Fiction: An Anthology (Seven Utopias and a Dream)*, trans. Leland Fetzer (Ann Arbor: Ardis, 1982), 35–54, <http://archive.org/details/prerevolutionary0000unse>.

55 Moynihan, "The Intellectual Discovery of Human Extinction," 262.

apocalypse, but is perhaps the first example in history of humans using outer space for its natural resources, in mining the Moon.

The final major astronomical event of this period, and the most widely-reported in English sources, was the Leonid meteor storm of 1833. The Leonids, a meteor shower that peaks roughly every 33 years, engulfed the midnight sky across much of North America on November 12-13. Newspapers “through all parts of the United States” recorded meteor sightings, with some meteors appearing as bright as Jupiter or Venus.⁵⁶ The number of meteors was regularly said to be beyond counting, as though the stars themselves were cascading across the heavens.⁵⁷ Denison Olmsted, American physicist and pioneer of meteor science, described the storm as “immensely great,” with the total by his observations at Boston numbering at least 207,840 meteors.⁵⁸ Joseph Smith, founder of Mormonism, recorded it in his diary as “a littler fullfillment [sic] of the word of God as recorded in the holy scriptures,” comparing the streak of meteors across the sky to the fall of hailstones.⁵⁹ Walt Whitman recalled a story told by Abraham Lincoln of the Leonid meteor storm, in which a deacon in Illinois awoke him in the night crying, “Arise, Abraham! the day of judgment has come!,” but, after observing for a while, Lincoln found that the world did not come to an end after all.⁶⁰ Like with Biela’s comet, there was a close association between the end of the world and astronomical phenomena. Despite apocalyptic fears, for Americans it remained one of the most memorable events of the nineteenth century: in his 1878 year-by-year recounting of the first century of the United States’ existence, Richard M. Devens reserves the year 1833 for the Leonid meteors alone above any other event.⁶¹

56 Denison Olmsted, “Observations on the Meteors of November 13th, 1833,” ed. Benjamin Silliman, *On the Meteors of 13th November, 25 (January 1834)*: 364–65.

57 “1833 Leonids,” *The Evening Post*, November 13, 1833.

58 Olmsted, “Observations on the Meteors of November 13th, 1833,” 389.

59 Joseph Smith, “Journal of Joseph Smith, 1832-1834” (Joseph Smith Papers, November 5, 1833), <https://www.josephsmithpapers.org/paper-summary/journal-1832-1834/21>.

60 Walt Whitman, *Specimen Days & Collect* (Philadelphia: Rees Welsh & Co., 1882), 336.

61 R. M. Devens, *Our First Century* (Springfield, Massachusetts: C.A. Nicholas & Co., 1878), 329.

The idea of extraterrestrial life, however, entered mainstream public discourse in the nineteenth century through a series of shocking articles published in *The Sun* newspaper of New York City beginning on August 25, 1835, ghostwritten by New York reporter Richard Adams Locke.

In an article titled “Great Astronomical Discoveries Lately Made by Sir John Herschel, LL. D. F. R. S. &c. at the Cape of Good Hope,” allegedly sourced from the *Edinburgh Journal of Science*, the author claimed to have seen life on the Moon through John Herschel’s own telescope. While fantastic voyages with demons or flying machines were hard to swallow in this era, the idea that a powerful new telescope could reveal flora and fauna 384,400 kilometres away was within popular expectations of astronomical technology. Sadly, even today this is far beyond possibility.

These “Great Astronomical Discoveries” were, unfortunately for advocates of lunar habitation, purely fictional, and the article later earned the moniker “The Great Moon Hoax.” Its literary style and appeal to astronomical authority, however, garnered it immediate attention and immense reach: overnight *The Sun* became the most-circulated newspaper on the planet with 19,000 copies printed of the August 26 issue, along with 60,000 pamphlets containing just the contents of the Moon Hoax.⁶² By the next year translations spread across France, Italy, Germany, and Mexico. It was translated into Russian from German the next year, though by the time Locke’s story had made it that far it was already known to be a hoax, if still an amusing and interesting read.⁶³ Other newspapers sang the praises of Herschel’s alleged discoveries, considered by the *New York Times* as “probable and plausible, and have an air of intense verisimilitude,” while the *New Yorker* declared “a new era in astronomy and science generally.”⁶⁴ Adding to its celestial sensationalism must have been the presence of Halley’s Comet in late August that year, as though a sign from the heavens of the veracity of *The Sun*’s second-

62 Crowe, *The Extraterrestrial Life Debate*, 272.

63 “About the Inhabitants of the Moon, and Other Memorable Discoveries Made by the Astronomer John Herschel,” *Biblioteka Dlya Chteniya* 16 (1836): 66.

64 Crowe, *The Extraterrestrial Life Debate*, 272; *Amazing Stories*, Sep 1926, 1926, 574, http://archive.org/details/amazing_stories_september_1926 The Sun of course understandably only printed affirmations of the story in its sample of newspaper reactions and no serious doubts or refutations.

hand claims.⁶⁵ John Herschel himself, meanwhile, was inundated with questions about the Man in the Moon, to which he gave an answer in good humour: he “drinks claret... and eats powdered beef turnip and carrot.”⁶⁶

In terms of its content and style, the Moon Hoax largely follows the example of its predecessors: life on the Moon has an exotic resemblance of that of Earth, with large, beautiful, and untouched landscapes resembling the Biblical image of Eden. Spaceflight plays no role in this lunar adventure, but the Naples edition of the article included some fanciful lithographs of a ship being towed to the Moon by chains and by the man-bats reported by the fictionalized Herschel, clearly reminiscent of seventeenth-century fantasies.⁶⁷

In its nineteenth century setting, however, the Moon Hoax functioned as a distinct mirror of the society that created and consumed it. Never before had the idea of a plurality of worlds been put so directly and sensationally before the reading public as through the popular press. Through a close-reading of its text and context, we can bring to light fundamental assumptions that lay between the author and reader which illuminate the contemporary relationship between Anglo-American society and outer space.

The first striking aspect of the Moon Hoax is its attribution to the British astronomer John Herschel: most readers of *The Sun* would have known his exploits and those of his father, and would have taken the announcement of such a great discovery as life on the Moon on faith due to his great prestige as an astronomer. This story also suggests that it was written for an audience familiar with the astronomical knowledge of the day, made possible by early popular science writers who gave lectures

65 Kevin Young, “Moon Shot: Race, a Hoax, and the Birth of Fake News,” *The New Yorker*, October 21, 2017, <https://www.newyorker.com/books/page-turner/moon-shot-race-a-hoax-and-the-birth-of-fake-news>.

66 Steven W. Ruskin, “A Newly-Discovered Letter of J.F.W. Herschel Concerning the ‘Great Moon Hoax,’” *Journal for the History of Astronomy* 33, no. 1 (February 1, 2002): 73, <https://doi.org/10.1177/002182860203300108>.

67 Salvatore Fergola, *Partenza di Pulcinella per la luna*, 1835, Lithograph, 59cm x 44.3cm, 1835, Library of Congress, <https://www.loc.gov/pictures/resource/cph.3a26356>; Gaetano Dura, *Diligenza di ritorno dalla luna*, 1836, Lithograph, 51.7cm x 41.1cm, 1836, Library of Congress, <https://www.loc.gov/pictures/resource/ppmsca.35550>.

on astronomy to lay audiences and simplified complex subjects like Newtonian physics for ordinary people.⁶⁸

In his commentary to the Moon Hoax in his sourcebook *The Extraterrestrial Life Debate, Antiquity to 1915*, Michael J. Crowe has given strong evidence that in writing the Moon Hoax Locke was satirizing the work of Thomas Dick, and was responding to his “extravagant... religio-scientific rhapsodies”.⁶⁹ To Locke, Dick’s employment of theology in the field of science was detrimental to rational science and, equally, “emasculating the minds of our studious youth.”⁷⁰

Locke tells his audience that with his new telescope in far-off Africa “[Herschel] has discovered planets in other solar systems,” and “affirmatively settled the question whether this satellite be inhabited.”⁷¹ This claim implies a readership that understands that our solar system is one of many similar formations in the universe, and that it is only to be expected that other stars also have planets accompanying them. By the knowledge of the time, this seems in hindsight like an extraordinary claim: exoplanets were not detected until 1992.

Like other Moon stories, but far more sophisticated, Locke gives the reader a lengthy explanation in the commonly-understood science of his time as to how, exactly, Herschel’s telescope can see minute details on the Moon: its power was allegedly increased through the application of a hydro-oxygen microscope projector to an incredible 42,000 times magnification!⁷² This is totally impossible. Even today, were such an immense magnification possible on a terrestrial telescope, any

68 “James Ferguson (1710-76) - Astronomy Explained upon Sir Isaac Newtons Principles and Made Easy to Those Who Have Not Studied Mathematics / James Ferguson,.” Royal Collection Trust, accessed August 30, 2022, <https://www.rct.uk/collection/1090094/astronomy-explained-upon-sir-isaac-newtons-principles-and-made-easy-to-those-who>; James Ferguson, *Astronomy Explained Upon Sir Isaac Newton’s Principles,; And Made Easy to Those Who Have Not Studied Mathematics* (London: James Ferguson, 1756).

69 Crowe, *The Extraterrestrial Life Debate*, 294.

70 Crowe, 295.

71 Richard Adams Locke, *Great Astronomical Discoveries Lately Made by Sir John Herschel, LL. D. F. R. S. &c. at the Cape of Good Hope*. (New York: The Sun, 1835), 2, <https://catalog.hathitrust.org/Record/000320858>.

72 Locke, 3, 7; For an explanation and illustration of hydro-oxygen microscopes, see a contemporary example in Edward Palmer, *Palmer’s Improved Portable Oxy-Hydrogen Apparatus and Microscope with Prepared Objects, Complete*, 1840, Illustration, 22cm, 1 page, 1840, Science History Institute, <https://digital.sciencehistory.org/works/mgnzgo2>.

fine details on the Moon's surface – smaller than a few kilometres in diameter – would be rendered indistinct by the distortion caused by light passing through Earth's atmosphere.⁷³ Nonetheless, the lengthy technical description of telescope technology distinctly resembles modern science fiction.

Locke gives his expectant readers the first sight of the Moon, and the discoveries begin. One question of the day, whether the Moon did or did not have an atmosphere, is solved right away through the presence of poppy-like flowers – the first sign of life on the Moon.⁷⁴ Alongside these Locke describes trees comparable to the largest English yews, as well as firs. Moon water is simply blue as on Earth.⁷⁵ The large lunar crater Aristarchus is revealed to be a volcano and juxtaposed with Etna and Vesuvius; active lunar volcanoes, described several times in the Moon Hoax, were a popular idea at the time in mainstream astronomical science, and William Herschel even claimed to have seen them erupt.⁷⁶ These specific details imply some level of popular familiarity with these ideas: for this hoax to be successful, they could not be completely new or outrageous to the reader.

Lunar fauna, meanwhile, includes miniature bison, a “monster” the size of a goat, resembling most of all a mythical unicorn, cranes and pelicans, reindeer, elk, moose, horned bears, and bipedal beavers – all immediately familiar to North American readers.⁷⁷ Most interesting of all, the beavers are some form of human-like life: “Its huts are constructed better and higher than those of many tribes of human savages” with the presence of billowing smoke from these structures evidence that these

73 It is worth noting that, in certain conditions, very small objects on the moon such as the Apollo Moon landers can be resolved - but only by telescopes such as NASA's Lunar Reconnaissance Orbiter, which is in outer space: NASA Content Administrator, “LRO Sees Apollo Landing Sites,” NASA (Brian Dunbar, March 10, 2015), http://www.nasa.gov/mission_pages/LRO/multimedia/lroimages/apollosites.html.

74 Locke, *Great Astronomical Discoveries*, 11; William Herschel argued that the Moon did in fact have an atmosphere, a point of contention in the 18th and early 19th centuries; James Sime and William Herschel, *William Herschel and His Work* (Edinburgh: T. & T. Clark, 1900), 55; As a strong counterpoint however, French astronomer Pierre-Simon Laplace measured the refraction of stars eclipsed by the Moon's disc, estimating the Moon's atmosphere - if it even existed - to be at least one thousand times thinner than Earth's, rendering it uninhabitable to terrestrial animals, though he remained open to the idea of lunar-adapted species inhabiting the satellite. Pierre Simon Laplace, *The System of the World*, trans. Henry Hickman Harte (Dublin: Dublin University Press, 1830), 41–42, <http://archive.org/details/systemworld02laplgoog>.

75 Locke, *Great Astronomical Discoveries*, 12.

76 Sime and Herschel, *William Herschel and His Work*, 56.

77 Locke, *Great Astronomical Discoveries*, 16.

humanoid creatures have made use of fire, implying the intelligence required to develop human-like tool use.⁷⁸ However, other than walking on two legs and lacking a tail they closely resemble beavers in head and body. Compared to previous discoveries, not much fanfare is made of this apparently lowest level of intelligent extraterrestrial life – in fact, these humanoid beavers are not even considered part of the same species as later intelligent life found elsewhere on the Moon. Given that this region, within the crater Endymion, is compared directly with the prairie landscape of North America and is inhabited by American animals, these lunar beavers may reflect contemporary perceptions of indigenous North American peoples.⁷⁹

The most extraordinary discovery is of four-foot tall humanoid creatures, much more distinctly like humans physically than the bipedal beavers, though they possess bat-like wings. Thus they are named man-bats, with the scientific name *Vespertilio homo*.⁸⁰ This name, following in the taxonomic style of Linnaeus, implies that these creatures were in some way related to humans, and as a suggestion of human relatives well before the 1864 discovery of *Homo neanderthalensis*. Indeed, when Locke republished his hoax independently in 1859, these creatures are explicitly referred to in the title as human beings.⁸¹

These man-bats are hairy all over except on their faces, which are described as being yellowish and reminiscent of an orangutan, and their hair is dark and curly, “but apparently not woolly.”⁸² They are observed having some kind of social structure and ability to converse with one another, and this leads to them being defined as the first rational beings discovered on the Moon: “innocent and happy

78 Locke, 17.

79 Locke, 16; A modern review in the *New Yorker* makes the same connection: Young, “Moon Shot,” para. 14.

80 Locke, *Great Astronomical Discoveries*, 20–21.

81 Richard Adams Locke, *The Moon Hoax; or, A Discovery That the Moon Has a Vast Population of Human Beings* (New York: William Gowans, 1859).

82 Locke, *Great Astronomical Discoveries*, 20.

creatures, notwithstanding some of their amusements would but ill comport with our terrestrial notions of decorum.”⁸³

The climax of the Moon Hoax begins naturally with the most beautiful and incredible lunar region, the crater Pitatus, closely reflecting Godwin’s Moon in its “paradisaical beauty and fertility, like primitive Eden in the bliss of their inhabitants.”⁸⁴ Here he finds a temple and speculates on its nature: “a fane of devotion, or of science, which, when consecrated to the Creator, is devotion of the loftiest order; for it exhibits his attributes purely free from the masquerade attire and blasphemous caricature of controversial creeds.”⁸⁵ It is architecturally both fantastical and familiar, built of sapphire or blue stone with colonnades and cornices and a spherical roof topped with flame-shaped details.

Finally, Locke gives the reader a sight of truly civilized, intelligent life: these lunar beings are immediately identified as being of the same species as the man-bats, but “of a larger stature than the former specimens, less dark in color, and in *every respect* an improved variety of the race.”⁸⁶ The image of a light-skinned, civilized and superior race on the Moon makes for a clear parallel to earthly European perceptions of racial hierarchy, a new detail in the history of descriptions of extraterrestrial life. The natural order on the Moon, perhaps, deliberately mirrors what Locke and others believed to be the proper hierarchy back down on Earth, another example of how the celestial bodies of the solar system were populated with terrestrial extrapolations. Though his intent is to write derivative satire, Locke too is possibly unintentionally adding to the pantheon of tropes about outer space: that of progress and superiority.

A description of the customs of these intelligent lunar beings follows: a banquet made up of nothing but fruit, the attending creatures seated in triangles, evidence apparently of “order and

83 Locke, 21.

84 Locke, 24.

85 Locke, 23.

86 Locke, 25.

subordination” among them.⁸⁷ To match the Edenic description from before, these intelligent beings are not seen taking part in “any work of industry or art... they spent their happy hours in collecting various fruits in the woods, in eating, flying, bathing, and loitering about...”.⁸⁸ There is no evidence of predatory creatures on the Moon, and all seem to live in harmony. This all brings to mind an image of Eden, and the fruit-gathering way of life is especially reminiscent of the book of Genesis, recalling God’s punishment of Adam: “Cursed is the ground because of you; through painful toil you will eat food from it all the days of your life. It will produce thorns and thistles for you, and you will eat the plants of the field. By the sweat of your brow you will eat your food until you return to the ground...” (Genesis 3:17-19, NIV). These creatures, one can infer, are humans from before the Fall, adding yet another layer to Locke’s satirical portrayal of theological astronomy.

In opposition to Crowe, I argue that the Moon Hoax by its very nature in being presented as real disqualifies it from being satire, regardless of Locke’s intentions or statements after the fact. Satire includes the audience in its distortion of reality to make them view the work’s central subject differently – be it contemporary society as in *Cyrano de Bergerac*, or a popular idea like Dick’s theological astronomy – while a hoax excludes them by conforming fiction to the audience’s expectations of reality and selling it as such. As Crowe explains, the Moon Hoax was widely believed and massively popular not because it was a more up-to-date version of Kepler and Godwin, but because “for a number of decades [the American public] had been prepared for them by the preachings and proclamations of such authors as Paine, Chalmers, Emerson, and Dick.”⁸⁹ All this is to say, the Moon Hoax was so influential because it was perhaps the first work of recognizable, popular science fiction as would later be seen in the early twentieth century.

87 Locke, 26.

88 Locke, 26.

89 Crowe, *The Extraterrestrial Life Debate*, 296.

The next flashpoint in the discussion around the plurality of worlds, and evidence of the continued popularity of the idea, is in the Whewell Debate, centred on the English Reverend William Whewell's 1853 publication *Of the Plurality of Worlds*.

He had earlier come to fame as a supporter of the plurality of worlds idea with his 1833 work *Astronomy and General Physics Considered with Reference to Natural Theology*. Whewell was then a lecturer at the University of Cambridge, and also at one time tutor to Alfred Tennyson whose musings on extraterrestrial life open this chapter. Through this Whewell became known as an authority on the subject, but stirred up little debate himself as he broadly agreed with the then-current paradigm. This all changed with his next major work on astronomy.

Of the Plurality of Worlds seemed to come out of nowhere and launched a massive, widespread, and public debate once more on the intellectual foundation of extraterrestrial intelligence, using the most up-to-date scientific theories while still framing his argument in theological terms which remained the standard of the day.

The reaction to *Of the Plurality of Worlds* was powerful: more than seventy published responses survive, twenty of which are books; the critical reception was so immediate as well that the following year Whewell published *Dialogue on the Plurality of Worlds* as a rejoinder to these critics.⁹⁰ He had published his first essay anonymously: so strongly-held was the prevailing opinion of the time that he feared arousing ire, painting the contemporary intellectual landscape with his observation that “it will be a curious, but not a very wonderful event, if it should now be deemed as blameable to doubt the existence of inhabitants of the Planets and Stars, as, three centuries ago, it was held heretical to teach that doctrine.”⁹¹ For the first time, here was an educated participant in the debate marshaling both science and theology to tackle the mainstream Christian arguments for the plurality of worlds. This

90 Crowe, 335.

91 William Whewell, *Of the Plurality of Worlds*, 1st ed. (New York: Cambridge University Press, 2009), iii.

essay would transform the way people thought about – and argued for – the existence of life on other celestial bodies.

The central charge that Whewell, an Anglican, makes against the argument for a plurality of worlds is simple: the Bible says nothing about life on other worlds.⁹² However, he does not take this theological quibble of *sola scriptura* as the core of his argument against this idea. Recognizing that many have truly accepted this doctrine into their own faith and thus appeals to the revealed text are not sufficient alone, his stance is that “on a point which rather belongs to science than to religion, perhaps philosophical arguments may be patiently listened to.”⁹³ As opposed to previous writers like Dick who made moral assumptions about the universe – for example, that God would not make a “waste” by creating lifeless worlds, or that microscopes reveal millions of invisible organisms – Whewell stresses that he is “collecting his scientific facts from the best authorities, and the most recent discoveries,” such that his essay is not only of religious interest, but has astronomical value as well.⁹⁴

Whewell takes Thomas Chalmers particularly to task, stating that he is arguing from ignorance, not from proof divine or scientific:

[T]he whole spirit of the scientific procedure, which has led to the knowledge which we possess, concerning other planets and other systems is utterly opposed to our making such assumptions respecting other worlds... Science, in proportion as she is confident when she has good grounds of proof, however strange may be the doctrines proved, is not only diffident, but is utterly silent, and abstains even from guessing, when she has no grounds of proof.⁹⁵

He criticizes Chalmers as making not only moral, but scientific assumptions about extraterrestrial intelligence, where neither astronomy nor scripture offer any evidence either way. A writer like Chalmers cannot take astronomical discoveries as evidence for a plurality of worlds and then refuse to engage in evidence-based scientific processes. Similarly, from a religious perspective,

92 Whewell, iii.

93 Whewell, iv.

94 Whewell, iv; The argument from the microscope was chiefly made by Scottish minister Thomas Chalmers; see: Crowe, *The Extraterrestrial Life Debate*, 336.

95 Whewell, *Of the Plurality of Worlds*, 45–46.

Whewell notes how all assumptions about extraterrestrials are made based on the imperfect human experience, judging the perfection of Creation. He sums this up in a powerful statement: “Astronomy no more reveals to us extra-terrestrial moral agents, than Religion reveals to us extra-terrestrial Plans of Divine government.”⁹⁶

Whewell turns to geology, a field that had not been used before to argue for or against the plurality of worlds. He uses up-to-date geological theories about the Earth to form his argument: contemporary science had shown through studies of the Earth’s surface that our planet is constantly undergoing physical change in many ways, with erosion wearing down mountain rivers into valleys and eating away at shorelines, and earthquakes causing some land to tumble down into the water while raising others up from the ocean.⁹⁷ This evidence shows that the Earth was not created exactly the way it looks in the present day, static from the moment of Creation. He notes that in the distant past some dry land was once underwater, and great mountains like the Himalayas once touched the sea as discovered in the sediments that constitute them: at high altitudes shells and fossils of marine animals have been found across the world. This suggests massive changes to the Earth’s surface in the past, and crucially that these changes were not sudden and catastrophic as was once believed, but gradual over very long periods of time. God, then, did not create Earth or presumably any other planet in an immutable, stable state.

More than that, however, he points out that the fossils found in mountain ranges are of animals that, by all current knowledge, no longer exist.⁹⁸ Whole species, themselves aspects of Creation, have had their era come and go before humans uncovered them. Despite his Christian background, Whewell professes that the “earth is, it seems, a domicile which has outlasted more than one race of tenants.”⁹⁹

96 Whewell, 49; As Michael J. Crowe discovered, this is the first-ever use of “extraterrestrial” to refer to life beyond Earth, see: Crowe, *The Extraterrestrial Life Debate*, 342.

97 Whewell, *Of the Plurality of Worlds*, 54.

98 Whewell, 59.

99 Whewell, 59.

He describes astonishing creatures that have no equivalent today, like dinosaurs, pterosaurs, and ancient sea creatures found as scientists descend into the lower strata of the Earth, with fewer and fewer remains the deeper and farther into the past they go and more and more evidence of occasional disruptions to previous life on Earth giving rise to successive life-forms up to the present day.

After continuing this purely scientific recounting of the geological facts, he begins his argument from geology in the problem of the extinction and creation of life on Earth. This being before theories of evolution became mainstream, Whewell is inclined to declare the emergence of new species as implausible, while evidence for extinction is much more well-established.¹⁰⁰ Yet, he notes, when we look back millions of years into Earth's fossil record, we find no evidence of human remains, let alone archaeological artifacts or ruins.¹⁰¹ Thus, there is one special case in all of Earth's history of a new species being uniquely placed on the Earth after it had existed for many epochs and had seen countless species disappear: that of humanity. Whewell shifts from geology to history and, using the Bible as an example of ancient scholarship attempting to trace human civilization to its origins, gives an estimate of human existence on Earth measuring several thousand years and no more.¹⁰² Furthermore, he separates humans from animals by referring to contemporary notions of civilization and progress: all humans, he argues, are possessed of the same capacity for rationality, language, and indefinite progress from generation to generation.¹⁰³ That various stages of progress were understood to exist, as then seen in comparisons of European civilization to cultures viewed as inferior such as in Africa or among the indigenous peoples of North and South America, was evidence of the special character of humankind: "By making man barbarous, we do not make him cease to be man."¹⁰⁴ To Whewell, from the perspective of Christianity and Victorian science, the human alone "is an intellectual, moral, religious,

100 Whewell, 78.

101 Whewell, 90.

102 Whewell, 92 As for other mythologies, such as those found in India and China, which add tens or hundreds of thousands of years to human history, Whewell explains that they are a clear fabrication on pp. 94-95.

103 Whewell, 81-82.

104 Whewell, 81.

and spiritual being,” a phrase he repeats throughout his essay as the definition of humankind.¹⁰⁵ This idea of human perfectibility and progress would become a fundamental aspect of thought on extraterrestrial life, even after the core theological concepts Whewell uses as evidence were dropped in favour of secular arguments.

If a planet without life is a waste, Whewell concludes, then for the vast majority of its existence the Earth was itself a waste – yet God found this sufficient.¹⁰⁶ If humanity has existed for only an atom of time in this most recent epoch of the Earth and in this specific region of space, the evidence for intelligent life elsewhere becomes very slim. He brings this to a poetic crescendo, with a remarkable extended set of rhetorical questions on the state of the other planets of our solar system:

The earth was brute and inert... so far as the light of reason and intelligence are concerned, for countless centuries before man was created. Why then may not other parts of creation be still in this brute and inert and chaotic state...? ... Or why should we assume that the condition of those planets resembles ours, even so far as such suppositions imply? Why may they not, some or all of them, be barren masses of stone and metal, slag and scoriae, dust and cinders?¹⁰⁷

In his ninth chapter, “The Planets,” Whewell makes a scientific account of each planet in the solar system and its chances of harbouring life. Neptune he disqualifies right away: it is thirty times farther from the Sun than the Earth, and judging by the light the Earth receives reflected off Jupiter, Neptune must be a very cold and dark world, hardly suited for life.¹⁰⁸

The Moon he tackles next, and he considers it an especially useful case: it and the Earth are the only two bodies in the solar system we can examine in fine detail, and so if Earth is inhabited and the Moon is not, then we have no evidence to assume that any other celestial body besides Earth features life.¹⁰⁹ He notes that, if the Moon is like Earth, then not only should we be able to see traces of civilizational change – like lunar equivalents of the Great Fire of London – but also terrestrial change,

105 Whewell, 89.

106 Whewell, 103.

107 Whewell, 107.

108 Whewell, 169.

109 Whewell, 170–71.

like volcanoes erupting and shorelines eroding. Nothing of the sort, however, has been observed on the Moon. He also argues against the Moon bearing water, as its supposed seas are solid in appearance and have consistent streaks on them, and uses the same argument as Laplace against the existence of any lunar atmosphere.¹¹⁰ If there is still somehow life on the Moon, it must be radically different from any form of life that has ever existed in Earth's long history – in other words, bereft of observable evidence.

Using mathematics, Whewell examines Jupiter, and finds it to have such little density for its size that it may be made entirely of water; considering Jupiter's strong gravity along with this conjecture, arrived at scientifically, Whewell deems it unlikely Jupiter contains any sort of life more complex than "boneless, watery, pulpy creatures."¹¹¹ Saturn receives less attention, with Whewell combining his arguments against Neptune (too far from the Sun) and Jupiter (low density, high gravity) to briefly dismiss it.

Because Venus and Mercury are closer to the Sun than Earth they are more difficult to observe with a telescope than the outer planets, with Venus appearing as a bright, glassy ball lacking any distinct features. Given Whewell's core critique in this essay, he refuses to speculate based on a lack of evidence but does note that the light and heat from the Sun must be twice and seven times more intense on Venus and Mercury respectively, making it less likely that they feature life in any form we may recognize.¹¹²

The one exception is Mars. With its rocky red surface and apparent green seas, traces of clouds and clear polar ice caps, along with a twenty-four hour day, Mars is remarkably similar to Earth and fairly close by.¹¹³ Based on the lower density of Mars and its distance from the Sun, Whewell judges that it must be fairly cold there, and any inhabitants very large and with skeletons perhaps like whales

110 Whewell, 174 Laplace noted in 1796 that the Moon does not refract the light of stars as the Earth does, meaning that it at best has an extremely thin atmosphere that could not sustain life as we know it.

111 Whewell, 180, 182–83.

112 Whewell, 191–92.

113 Whewell, 187.

in the Martian seas and dinosaurs upon the land. He leaves any suggestions about intelligent creatures moot, rather than discussing possibilities or no: in order to begin to entertain the idea of intelligent extraterrestrials, there first must be any evidence of some kind of life on another planet. After all, Earth had life before humans were created, and in one of his most prescient and interesting observations, Whewell compares Mars to Earth “in some of its remote geological periods,” and that “it is at least equally possible that he may be an image of the Earth, in the still remoter geological period before life began.”¹¹⁴ The question is open as to whether life could ever emerge on Mars – or if it already had in the past, and went extinct.

Whewell’s position, backed by scientific evidence, has remained strong in the many years since: the Earth is in a unique place within our solar system to support life, while no life of any sort has been discovered elsewhere upon our planetary neighbours and the Moon. In fact, Whewell would again precede later science by hypothesizing that Earth exists in what he calls the “Temperate Zone” of the solar system, in which the conditions for life are ideal: not too hot or cold, and not too moist or dry, much as certain regions of the Earth are more temperate and suitable for human habitation while the planet’s extremes are not.¹¹⁵ This idea exists today in another form as the concept of the habitable zone of a solar system, as determined from Earth.¹¹⁶

In his conclusion, Whewell again discusses the idea of progress in relation to extraterrestrial life, presaging utopian fiction that would emerge as immensely popular literature by the century’s end. He pictures a “New Period” of humanity, in which advancements seen in his own lifetime were carried even farther: “that all need for manual labour shall be superseded; and thus, abundant time shall be left to [humans] for developing the intellectual and moral powers which must be

114 Whewell, 191.

115 Whewell, 195.

116 Crowe, *The Extraterrestrial Life Debate*, 350.

the higher part of its nature.”¹¹⁷ Similarly, just as railroads and electric telegraphs revolutionized human communication, “We can imagine this facility and activity of communication, in which man so immeasurably exceeds all animals, still further increased, and more widely extended.”¹¹⁸

These were common traits of future utopias in nineteenth-century literature, but Whewell makes an early association of this utopia with outer space: “men might be able to dart... from planet to planet, and from star to star,” though like his seventeenth century predecessors he pictured this being accomplished through wings, like angels.¹¹⁹ Although he was skeptical of extraterrestrial beings, he nonetheless believed that humanity’s utopian future may lay in outer space, not on Earth.

Whewell’s essay revealed a fundamental contradiction in the preceding debate over the plurality of worlds: that it was based on astronomical discoveries, but in terms of evidence rested on the Christian hopes and feelings of its participants. Commentators like scientist David Brewster, an associate of Thomas Chalmers and regular intellectual rival of Whewell, accused Whewell of having “a mind without faith and without hope... dead to feeling and shorn of reason.”¹²⁰ Brewster’s arguments remained grounded in pre-Whewellian conjecture: that regardless of its scientifically-defined properties and inferred surface conditions, Jupiter must harbour life simply because it is so massive, and God would not make such a grand world without a similarly grand purpose, that is, to be populated with people and animals. It is, in most parts, an *ad hominem* attack against Whewell for not having enough imagination and spirit, and for going against “opinions universally believed.”¹²¹

The most impassioned response would come from none other than the eminent astronomer John Herschel, who read the essay in its anonymous original form in January 1854. He was utterly taken

117 Whewell, *Of the Plurality of Worlds*, 273.

118 Whewell, 273.

119 Whewell, 274.

120 Crowe, *The Extraterrestrial Life Debate*, 355–56.

121 Crowe, 357.

aback: to him the planets had to be great and beautiful and full of life – because the thought that flawed human life was the only intelligence in the universe pained him deeply:

So *this* then is the best of all possible worlds—the *ne plus ultra* between which and the 7th heaven there is nothing intermediate. Oh dear! Oh dear! 'Tis a sad cutting down. Look only at the Russians & Turks. Look at the revelations of the Blue Books & the Police Courts I can't give in my adhesion to the doctrine that *between* this and the angelic there are not some dozen or two grades of intellectual and moral creatures.¹²²

Whewell believed in the infinite power of human redemption to build a better, more peaceful world; Herschel rested his hopes on the idea that there were more beautiful and more heavenly beings out there in the cosmos. Although Herschel would also praise the geological argument made in the essay, in his 1867 obituary of Whewell he maintained that Whewell's later work should not be taken seriously, but be seen as a "lighter composition," a sort of devil's advocate writing but not worth full intellectual engagement.¹²³

Despite these vehement rebuttals, Whewell's point resonated with others: Darwinian scientist Thomas Henry Huxley agreed that the plurality of worlds debate was ultimately based on "hyper-hypothetical... speculations" and "essentially unfitted for discussion."¹²⁴ The leading Catholic theologian John Henry Cardinal Newman complained that "it almost amounts to blasphemy to doubt" the pro-plurality argument, also agreeing that it is largely based on presumptions of faith.¹²⁵ These two were intellectual heavyweights of the Victorian era, but as Newman attests, they were still in the minority even after Whewell's powerful essay.

Like Herschel, many post-Whewell commentators founded their arguments on the mediocrity of the Earth and even of humanity. Perhaps also like Herschel they saw the poverty and suffering on Earth and could not bear to imagine this was God's only moral creation. James Stephen, professor of Modern

122 Crowe, 359 Herschel here refers to the then-ongoing Crimean War between Russia and the Ottoman Empire, and the infamous Blue Books published by the British government in 1847 that excoriated the Welsh people and their language.

123 Crowe, 360.

124 Crowe, 361.

125 Crowe, 362.

History at Cambridge, lamented that “Can it really be that this world is the best product of omnipotence, guided by omniscience and animated by Love?”¹²⁶ Alfred Lord Tennyson expressed similar doubts, saying “it is inconceivable that the whole Universe was merely created for us who live in this third-rate planet of a third-rate sun.”¹²⁷ Their dissatisfaction with Earth and humankind demanded a new equivalent of angels, a cosmic heaven in the universe that justified the awful state of humanity.

The debate, however, was not limited to the poets and intellectuals: in his 1857 novel *Barchester Towers*, the English novelist Anthony Trollope, a contemporary of Charles Dickens, portrays two ordinary women talking about theories on the plurality of worlds, with one asking the other, “Are you a Whewellite or a Brewsterite, or a t’othermanite?” and “You don’t believe in the pulpy gelatinous matter?”¹²⁸ The precise language and references show that the debate must have been recognizable broadly in the Britain of the mid-nineteenth century, not just in its participants but in its specific ideas.

As it seems, Whewell’s rigorous scientific evidence mattered little in the face of offending popular perceptions of the universe. There was no wonder or poetry in a cosmos of millions of stars where only one could sustain life. Whewell misjudged the plurality of worlds debate: by the nineteenth century it had become not simply an astronomical-theological position, but a particular kind of hope; it was not so much that proponents of extraterrestrial intelligence believed their evidence was strong, but that they wanted to believe it could be true and sought whatever theological or scientific appeals they felt could justify their conjectures.

Whewell’s essay, despite failing to convince many, still marked a watershed moment in the plurality of worlds debate in two major ways. First, post-Whewell arguments become increasingly

126 Crowe, 364.

127 Crowe, 365.

128 Crowe, 365–66 The “pulpy gelatinous matter” is an almost verbatim quote from Whewell’s essay when he writes about life on Jupiter, as he memorably calls them, “boneless, watery, pulpy creatures.”

secular with less emphasis on arguments from theology. Second, after Whewell had pierced open the question of scientific evidence (or lack thereof) for extraterrestrial life, the search for this evidence became a new focus of pro-pluralists. Where Dick had argued from interpretations of scripture, later writers would use new astronomical, geological, and biological theories to make rational postulates favouring the old idea of life on other worlds.

In the second half of the nineteenth century, the field of astronomy underwent drastic changes in its epistemology and organization. In the first part of this chapter we typically encountered astronomers of a very particular type: individual amateur scientists who made philosophical and cosmological speculations based on their interpretation of what they could see through their telescopes. Many of these were theologians, or otherwise dedicated their research to a desire to better understand God's creation. Crucially, they had no way to physically understand celestial bodies beyond Earth other than through mathematical studies of their motion and position in the sky, making assumptions based on conditions that existed on Earth's surface.

That changed with the advent of spectroscopic astronomy. A spectroscope splits light into a full spectrum and displays this spectrum for analysis. A key part of a spectroscope's output are spectral lines: distinct bright or dark lines that break up the light spectrum in unique patterns, specifically identifying atoms and molecules absorbed or emitted by the measured light. This was revolutionary for research into the physical universe: by studying the spectral lines in the light from distant stars or refracted by planetary atmospheres, astronomers now had proof that the universe was made up of the exact same elements and chemical principles as found on Earth, and an examination of the elemental makeup of the planets was now possible. This marked the beginning of the 'New' astronomy, founding astrophysics and astrochemistry.¹²⁹

¹²⁹ Crowe, 370; Barbara J. Becker, *Unravelling Starlight: William and Margaret Huggins and the Rise of the New Astronomy* (New York: Cambridge University Press, 2011), 11–12.

Spectroscopy simultaneously marked a massive leap in astronomical understanding and a widening of the gap between professional astronomy and popular belief. Although the great pioneer of astronomical spectroscopy, William Huggins, had once declared for the existence of extraterrestrial life, he would by 1866 recant: in a 1909 collection of his scientific papers he writes that his stance changed because his “mind had... freed itself from the dogmatic fetters of [his] early theological education” that had led him to believe at first in the plurality of worlds.¹³⁰ Just as Whewell had outlined, the problem of evidence had struck the extraterrestrial life debate, and its ties to theological argumentation had soured it for prominent new astronomers like Huggins.

Pro-pluralists had to adjust their strategy and adopt new methods as they faced a new intellectual world. One pedagogical text on astronomy, originally published in 1897, dedicates just one paragraph in its four hundred pages to the question of extraterrestrial worlds, which highlights how narrow the debate had become by the end of the century: “only by long continued observation of the behavior of canal and oasis in both hemispheres of Mars, can we hope for a rational solution of the question of life in another world than ours.”¹³¹ This is a far cry from William Herschel’s arguments that every sizable body in our solar system bore life.

There is further evidence for this post-Whewell shift in earlier pro-pluralist writing, particularly that of the relatively obscure William Leitch and the immensely popular Richard Proctor.

Leitch, a Scottish-Canadian minister, continued the traditional line of using astronomy as a method of understanding the creative power of God. In his chief work, *God’s Glory in the Heavens*, Leitch mixed this traditionalism with a remarkable prescience and adaptability. Following Whewell, he agreed that *a priori* theological arguments for a plurality of worlds – arguing that it is in the basic character of God to create inhabited worlds – are insufficient.¹³² Metaphysical and scriptural arguments

130 William Huggins, *The Scientific Papers of Sir William Huggins* (London: W. Wesley and Son, 1909), 60.

131 David Todd, *A New Astronomy* (New York: American Book Company, 1897), 317.

132 William Leitch, *God’s Glory in the Heavens*, 3rd ed. (London: Alexander Strahan, 1867), 302–3 Though it is not popularly known, Leitch was one of the earliest writers to seriously propose rockets as the means of travel through

he dismisses as being circular and straining the Word of God, respectively.¹³³ Further, he also criticizes the analogical argument, that because the other planets bear some similarities to Earth, conditions upon these worlds must be analogous to Earth; this argument falls apart simply on considering how vastly different the other planets are in terms of fundamental properties like gravity, mass, temperature, and distance from the Sun, all of which vary from Earth above and beyond the geological variations found in Earth's past. His assessment of the potential of extraterrestrial life is thus tightly constrained compared to his predecessors: "it is likely that only a comparatively brief cycle of [a planet's] history is set apart for the display of the phenomena of life and intelligence."¹³⁴

The emphasis Leitch places on theology in discussing extraterrestrial life may be at the root of his book's relative unpopularity. He explicitly cites Whewell's essay as the main work of anti-pluralist literature, but questions why he chose anonymity: from Leitch's experience as a minister, he found that although belief in a plurality of worlds was a popular sentiment, it was by the great majority of Christians still a "fanciful speculation" with only a rare few taking it as formal doctrine.¹³⁵ He follows this by striking out against what he felt was the chief argument against pluralism: that it makes man, and by extension the sacrifice of Christ, so insignificant as to be meaningless. This is nonsensical to Leitch, who notes that divine redemption is not a commercial transaction, and abundance does not lessen its value – just as a father does not love his individual children less the more of them he has.¹³⁶ For Leitch, ultimately, the central goal of the Christian mission is an extraterrestrial one, to "bring us into closer alliance with all the various grades of moral intelligences throughout the universe."¹³⁷

space, in the section of this book titled "A Journey Through Space." He does not, however, approach it in a technical manner, and to avoid amateur speculation of what such a rocket would look like, he opts to make his imaginative journey through space on a comet instead.

133 Leitch, 305, 307.

134 Leitch, 313.

135 Leitch, 318.

136 Leitch, 326–27.

137 Leitch, 328.

Where Leitch saw a few editions of his book circulate in the latter half of the nineteenth century, Richard Proctor's *Other Worlds than Ours*, originally published in 1870, was reprinted twenty-nine times.¹³⁸ Proctor's work, more than any other, distinctly shows how much the plurality of worlds debate had shifted from the beginning of the century.

Proctor originally intended to become a barrister, but like many others was drawn to astronomy because of the suggestion it, like geology, offered of "other forms of life than those with which we are familiar," a particular preoccupation for him despite his self-admitted lack of much scientific knowledge.¹³⁹ Just as the exciting and strange dinosaurs of Earth's distant past imbued geological study with renewed popular interest, the possibility of life on other worlds made otherwise uninteresting or remote astronomical discoveries fascinating to the public, amplified by the personal character of writers like Whewell and Brewster and the passion their debates inspired.

Like Leitch, however, Proctor adopted some of Whewell's skepticism: it was not enough to argue by the simple example of Earth, even if God seemed to accord it a special place: "an analogy founded on a single instance has no logical force."¹⁴⁰ Similarly, where Whewell used geology to argue that planets do not necessarily bear life – let alone intelligent life – Proctor used geology to the opposite end, seeing how life had adapted to various diverse conditions on Earth from scorching deserts to frigid glaciers, and had done so for a remarkably long time. Not only geology, but Darwinian biology influenced the pluralist debate.¹⁴¹ In a way that previous writers could not, Proctor was able to discuss the idea that life on other worlds may not resemble Earthly life at all, by adopting modern scientific theories of evolution.

Other Worlds than Ours also marked the entry of spectroscopic astronomy into the pluralist

138 Crowe, *The Extraterrestrial Life Debate*, 386.

139 Richard Proctor, *Other Worlds than Ours* (New York: P.F. Collier & Son, 1901), 17, 10.

140 Proctor, 23.

141 Proctor, 24–25 Here Proctor mentions Darwin explicitly: theories of evolution had naturally made a deep impression on a debate marked by the question of how life could emerge beyond Earth.

debate. Proctor, writing for a popular audience, did his best to simplify the spectroscope's utility by offering a comparison of the telescope as "light-gatherer" while the spectroscope is a "light-sifter."¹⁴² Following from his use of Darwin and geological processes to advocate for the potential variation in life on other worlds, Proctor used spectroscopy to show that material evidence existed for an elemental uniformity across the solar system. Whewell's argument against analogy finally had a contender: if the other planets were made of the exact same stuff as Earth, it was perfectly reasonable to argue from analogy, as the building blocks of terrestrial life may be found elsewhere.¹⁴³ After this he goes even further, suggesting that since the Sun is composed of these same elements, other stars must be also – meaning these stars plausibly have their own planets orbiting them. Given the inability to physically visit and study other planets this was a reasonable supposition, similar to logical assumptions made by geophysicists about the interior of the Earth.

In his first book on the pluralist debate, Proctor is neither as optimistic as Herschel, nor as restrained as Leitch. Though he agrees that the Moon and Sun must not bear life, he is open to scorching Mercury having some intelligent inhabitants, and believes "the evidence we have points very strongly to Venus as the abode of living creatures not unlike the inhabitants of earth."¹⁴⁴ This evidence is, like that of his predecessors, mostly speculation as the surface of Venus is not visible. Although he occasionally uses the language of theology – he does not let his reader forget that his fundamental view of astronomy is as a glimpse into the creative work and mind of God – Proctor's greatest debt to earlier pluralist writers is his continued use of the argument for utility: when discussing the Martian ice caps, for example, which seasonally melt and return, he concludes this must indicate flowing water or rainfall, which would be purely wasteful if there was no life to be nourished by such rainfall.¹⁴⁵ It is no

142 In a quite revealing way, it is only here when writing his technical description of spectroscopy that Proctor asks his reader to bear with him, see Proctor, 58–57.

143 Proctor, 60.

144 Proctor, 97.

145 Proctor, 102.

longer God's creativity that necessitates life, but the existence of physical features resembling those of Earth. This same logic would be later used to great effect by those arguing for the existence of canals on Mars.

Despite relying in part on outdated arguments, Proctor was in other ways an innovator: building off of the drawings of William Rutter Dawes, he pioneered the field of *areography* – that is, of course, geography but as applied to Mars.¹⁴⁶ His map of Mars was the most detailed chart made by this point and was the first to give names to many of the features of the planet's surface, including naming the largest apparent continent after Dawes. Proctor takes his readers on a topographical tour of Mars in much the same way as a European travel writer of his era, describing strange new seas and landmasses.

Even though it had been observed by this point that the Moon had no continents and oceans, Proctor insisted, just as the early Moon observers did, that the darker regions of Mars were oceans, while the lighter areas were dry land. He is fully aware of this seeming contradiction, raising the question himself so that he can dismiss it with his own argument: of course these must be oceans and continents, because unlike the Moon the planet Mars shows clear evidence of regular change on its surface, shown not only by the melting of its ice caps but also by Martian weather obscuring the planet occasionally, much as Earth may appear obscured by clouds to an extraterrestrial observer on Venus.¹⁴⁷ This is not far from the truth: we know today that Mars is regularly beset by huge dust storms that make observing the planet's landscape impossible.

Other Worlds than Ours set the bar for post-Whewell extraterrestrial writing: it reflects the conscious understanding among pro-pluralists that speculative astronomical theology alone could not survive against Whewell-style argumentation, and that their beliefs risked becoming unfashionably antiquated if they did not adjust to changing knowledge about Earth and outer space. Proctor assures

146 For Proctor's map, see Proctor, 109 On the following page he explicitly introduces the term "areography," not his own invention but his usage here suggests he does not expect his audience to be familiar with it.

147 Proctor, 112, 114–15.

his readers that he is no idle thinker, but that in his arguments for extraterrestrial life “we have been guided onward by no speculative fancies, but simply by sober reasoning.”¹⁴⁸ He distances himself from his predecessors and openly embraces exciting, cutting-edge theories and inventions like Darwinian evolution and the spectroscope. This is as much a battle for scientific credulity as it is for popular approval and attention.

Only five years later, however, Proctor published again, and with a new theory on extraterrestrial life. In it he revisits Whewell, who he once believed to be making some kind of joke when he published his anti-pluralist *Of the Plurality of Worlds*. In this new work he recognized “in Whewell’s later views the result of longer and more careful study than he had given to the subject [earlier].”¹⁴⁹ So, too, did Proctor find himself reconsidering his extremely popular prior work.

With *Our Place Among Infinities* Proctor fully broke with the analogical argument: he accepted it, like Whewell, as suggestion rather than true evidence, and at worst pure imagination.¹⁵⁰ His dismissal of the optimistic pluralists of the Herschel and Brewster type drips with sarcasm: “this [analogy] done, every other consideration may be conveniently overlooked, and we may proceed to conveniently descant on the wonderful dignity of [Jupiter], with as little question of its being inhabited as though we had seen with our own eyes the creatures which exist upon the planet’s surface.”¹⁵¹ So much for pluralism!

Proctor, like Whewell, hammered at the precise weak point of the pluralist argument that he himself had adopted only five years before: the existence of extraterrestrial life was purely imaginary, and even as spectroscopy and Darwin offered theories as to how other worlds were similar to Earth and how life may adapt to planets so different from our own, there still was no proof of extraterrestrials

148 Proctor, 126.

149 Richard Proctor, *Our Place Among Infinities: A Series of Essays Contrasting Our Little Abode in Space and Time with the Infinities Around Us* (New York: D. Appleton and Company, 1876), 48.

150 Proctor, 48–49.

151 Proctor, 49–50.

themselves. It was a speculative hope: pluralism was as much about wanting life to exist on other planets as it was about making arguments for this hypothetical life. One could either accept as logical the supposition that other planets were enough like Earth to make rational arguments about its surface conditions, or reject it as Proctor now did. Neither side had empirical evidence that could prove the other wrong.

His position had settled to a more pessimistic and compromising one far closer to Whewell than to the original pluralists. Taking into consideration the vast age of Earth and the solar system, Proctor's perception of life on other worlds shifted in space and time: though Earth is the present "abode of life" as we can personally attest to, that life will eventually cease and Earth will become barren like the Moon.¹⁵² Far from the optimism of early pluralists, this view is remarkably bleak: "a time must come when the condition of our earth will no longer be suited for the support of life."¹⁵³

This idea, which grew in popularity among astronomers toward the end of the nineteenth century, held that the centre of life in the solar system was once on ancient Mars, shifted to Earth, and may eventually transfer to Venus in the future. Crucially, Proctor clarifies here that when he as well as earlier pluralists talk about "life" what they really mean is strictly qualified as rational, intelligent beings like ourselves. Although life on Earth has existed for a long time, human beings have only been around for a fraction of that period; Proctor's new argument hinges on a belief that intelligent life is brief and transitory, and that all planets may have their fragment of time in which they enjoy the presence of creatures like ourselves.¹⁵⁴ Plants and "lesser" animals are apparently not so exciting. People at this time who imagined extraterrestrial life fundamentally understood and valued life in the sense of intelligent creatures like themselves, just as the climax of Locke's story arrives not with the lunar unicorns or beavers but with the first sighting of the man-bats.

152 Proctor, 60.

153 Proctor, 60.

154 Proctor, 69–70.

Despite having so drastically shifted the goalposts for pluralism, Proctor continued to identify as a pluralist: in other essays he published between 1870 and 1875, Proctor came to conclude that “neither animal nor vegetable forms of life known to us could exist on Mars,” a massive shift from his initial assertion that the polar ice caps on Mars must necessarily exist to nourish its inhabitants.¹⁵⁵ Ironically, fans of Proctor formed a Proctor Memorial Association after his death and attempted to fundraise money to build a 1,200 inch aperture telescope with a representative of every nation on Earth working at its observatory in California; the stated purpose of this gargantuan device was to fully reveal “the secrets of Mars and the other planets,” which the *New York Times* took to imply that it “Will See Men on Mars,” just as Locke’s fictional telescope did for the Moon.¹⁵⁶

155 Crowe, *The Extraterrestrial Life Debate*, 386.

156 “Will See Men On Mars: Proctor Memorial Association Planning A Telescope. It Will Be a Memorial to Richard A. Proctor, the Astronomer, and Will Be Erected at an International Observatory to Be Located on San Miguel Mountain, California -- A New Scheme of Constructing a Monster Lens.,” *New York Times*, 1896; Crowe, *The Extraterrestrial Life Debate*, 387 For context, the largest telescope ever made is the 409-inch aperture of the Gran Telescopio Canarias, completed in 2006.

Chapter 1.2: The Mars Craze

In 1924 a telegram went out to the United States Navy's shore radio stations from the Secretary of the Navy: "Navy desires cooperate astronomers who believe possible that Mars may attempt communication by radio waves while they are near together."¹⁵⁷ This directive ordered all operators of this new and advanced device to cover as wide a band of frequencies as possible continuously from midnight on August 21st to midnight August 24th. This was not simply the wild fancies of one mad scientist with a radio transceiver: this goal was serious enough that the US government deemed it acceptable to allocate high-tech military resources to the discovery of extraterrestrial life. This was the first entry of a national government into the realm of space travel and communication, three decades before the launch of Sputnik. In the early twentieth century, there was an almost universal popular belief that contact with Martian life was imminent: the main question in the 1920s was whether that contact would be first achieved by radio, camera, or rocket.¹⁵⁸

This chapter will explain how the plurality of worlds debate reached its apex from 1877-1924, reviving serious belief in extraterrestrial intelligence among academics and the public alike. These two dates mark two oppositions of Mars and the rise and decline of the Mars craze: the 1924 opposition in particular was the closest since the mid-nineteenth century, and the last such approach of Mars to Earth until 2003. The American public waited with bated breath to learn via telescope or radio of their fellow-beings on that red planet: and were disappointed. No message arrived, no great saviour or destroyer came to Earth, and astronomers found that modern telescopes simply could not reveal any more detail

157 Secretary of the Navy, "Telegram from the Secretary of the Navy to All Naval Stations Regarding Mars" (National Archives and Records Administration, August 22, 1924), 7241, National Archives at Seattle, <https://catalog.archives.gov/id/596070>.

158 "Which Will Bare Secrets of Mars--Rocket, Radio, or Camera?," *New York Tribune*, October 9, 1921.

about Mars, not enough to truly confirm the existence of life there.¹⁵⁹ Despite this, hope for a long-awaited revelation about life on other planets persisted.

If there are any intelligent beings on Mars, then in 1877 they must have felt an intense and uncomfortable sensation of being watched. That year marked the planet's perihelic opposition, a rare event when Mars is simultaneously at its closest point to the Sun and is directly opposite the Sun from Earth, bringing the two planets within 56 million kilometres of one another. This makes for particularly good observing, and with improved telescopes and spectroscopes compared to the last such opposition in 1854, astronomers around the world made the most of it.

The 1877 opposition allowed greater detail than ever before to be discovered on Mars, but two findings in particular brought Mars to the centre of popular imagination about outer space for decades: the discovery of its twin moons Phobos and Deimos, and the observation of fine details on its surface.

American astronomer Asaph Hall, despite common knowledge asserting that Mars simply had no satellites, persisted regardless and ended up with “one of the most remarkable episodes in the annals of contemporary astronomy,” as it was described by the journal of the Royal Astronomical Society.¹⁶⁰ With this, Mars joined the pantheon of “noble” planets, along with Earth, Jupiter, and Saturn, and coincidentally adhered to the principle of planets bearing more moons the farther they are from the Sun. In his report to the Royal Astronomical Society, Hall concluded by making reference to a German astronomer's idea to light up fire signals in Siberia to communicate with the inhabitants of the Moon – believing that the visibility of the moons of Mars from Earth proved that this was “by no means” outrageous or impossible.¹⁶¹

159 Robert J. Trumpler, “1927 Observations on the 1924 Mars Opposition,” *Lick Observatory Bulletin* 13, no. 387 (March 1927): 19–45.

160 Asaph Hall, “The Discovery of the Satellites of Mars,” *Monthly Notices of the Royal Astronomical Society* 38 (February 1878): 205.

161 Hall, 207 Hall was himself something of a science fiction fan, having read Edward Everett Hale's “The Brick Moon” according to the preface of the 1899 reprint of a collection of Hale's short stories.

A decade earlier, Mars had been treated by Huggins' spectroscope and found by the great astronomer to have an atmosphere bearing water vapour like our own.¹⁶² The credibility of this finding was rendered uncertain by later spectroscopic analyses of Mars in the 1870s, but it laid the foundations for the age of extraterrestrial evidence built by Giovanni Schiaparelli and Percival Lowell: the discovery of canals on Mars.

The greatest feat of engineering of its time, the Suez canal was completed in 1869 to much fanfare, including a long parade of ships, fireworks, and extravagant delegations from the great powers of the day.¹⁶³ Contemporary writers drew vaunted comparisons to an ancient Egyptian canal around the same place which took a century to build, a testament to the creative power of modern civilization. Suez certainly would have been close in the mind of one Giovanni Schiaparelli, who studied hydraulic engineering at the University of Turin and graduated in 1854, going on to work at two of the top observatories of the time, in Berlin and St. Petersburg. Just a month after Hall's observation of Phobos and Deimos, Schiaparelli, perhaps inspired by Hall as well as the prior areography of Dawes and Proctor, decided to make his own chart of Mars.¹⁶⁴

Schiaparelli, like Proctor, named the darker, bluish-green areas of the planet as seas, while the lighter red regions were landmasses. What his observations uncovered that none before him had, however, were distinct dark lines along the planet's surface: his *canali*. The best-known story here is that the reception of *canali* as "canals" in English was a mistranslation unintended by Schiaparelli, an idea popularized in Carl Sagan's *Cosmos* where this origin is repeated.¹⁶⁵ George Basalla argues otherwise, pointing to Schiaparelli's education in canal engineering, popular excitement around the Suez canal, and the fact that *canali* refers to both artificial and natural waterways, suggesting that

162 David M. Harland, *Water and the Search for Life on Mars* (Chichester, UK: Springer Science & Business Media, 2007), 11–12.

163 Alexander Russel, *Egypt: The Opening of the Great Canal* (Edinburgh: The "Scotsman" Office, 1869), 54–60, <http://archive.org/details/egyptopeninggre00russgoog>.

164 Basalla, *Civilized Life in the Universe*, 56.

165 Carl Sagan, *Cosmos* (New York: Random House, 1980), 107.

Schiaparelli's nomenclature is intentionally ambiguous, a reflection of the astronomer's own uncertainty.¹⁶⁶ Schiaparelli, indeed, never did speak out against the interpretation of the *canali* as artificial.

At this point it is helpful to make some notes about planetary observation and its numerous foibles, to explain how exactly Schiaparelli and others saw canals, water, and vegetation where there is none. First, when looking at Mars through a telescope, the light collected by the telescope's aperture has been diffused by Earth's atmosphere much as a prism splits visible light into its spectrum of red, green, and blue. The red light naturally blends well with the surface of the planet, while the green and blue appear at the edges of the planet's disc. These distortions can be greater or lesser depending on turbulence in the Earth's atmosphere.

This ties into the second important aspect of planetary viewing: the massive possible variations in observations of the same object in space. The mirrors and lenses of nineteenth-century observatory telescopes were unique creations, masterworks of their crafts with no two precisely alike. Not only the quality and characteristics of each telescope, but also the geographical location of the observatory, the atmospheric conditions both on Earth and Mars, the time of year, air temperature and quality, and the viewer's own eyesight all contribute to what appears in the telescope's eyepiece.

Third, and most crucial to the perception of the Mars canals, is the psychological aspect of astronomical observation. Generally speaking, it is easy to see details on other planets and the Moon that you anticipate to find there. With an object as distant and small as Mars, surface details are little more than a blur, distinguished by faint changes in colour and shade. Similarly, even with fairly low magnification, it is easy to spot small details on Jupiter merely because the viewer, having seen pictures of Jupiter before, knows what to expect to see. The eye fills in detail where there is little owing to past perceptions and the interpretations of the imaginative mind. This was even more the case in the

¹⁶⁶ Basalla, *Civilized Life in the Universe*, 55.

astronomical era before astrophotography, in which observations of outer space were sketched down, transmitted from the subjective eye to the imaginative mind to the imperfect hand. Schiaparelli, an engineer by trade and familiar with the straight lines of architectural drafting, could easily have seen similar lines on Mars and half-consciously repeated them in his drawn map.¹⁶⁷ Later astronomers like Lowell and others, hoping to see canals just as pluralists hoped to find evidence of life on other planets, saw canals in no small part because they wished them into being. The picture was already flawed and ambiguous in the lens of the telescope; their curious minds did the rest.¹⁶⁸

At the same time that Schiaparelli was plotting his *canali*, another astronomer was drawing his own map of Mars. He was Nathaniel E. Greene, and the relative obscurity of his name in comparison may well be due to the fact that his 1877 Mars map featured no canals, and instead resembled a somewhat more detailed treatment of the planet than Proctor and Dawes' efforts. Greene, reviewing Schiaparelli's charts, criticized his Italian counterpart for mistaking unconnected dots or dark spots created within the lens or by his eye as straight lines; Schiaparelli, undeterred, fired back that the *canali* were as plainly obvious as the Rhine river, suggesting that anyone ought to be able to see them.¹⁶⁹ In fact, when Schiaparelli soon after double-checked Mars in his telescope to see the *canali* again, he made an incredible discovery: the canals had doubled! New lines identical and parallel to many of the originals had appeared, but Schiaparelli dismissed the idea that these new *canali* were merely a trick of the eye. This alleged germination became one more facet of the emerging popular mythology surrounding Mars and its inhabitants.

The *canali* effect struck the astronomical world, with many astronomers searching for evidence or lack thereof; those who opposed Schiaparelli's canals claimed that he had strained his eyesight to the

167 Basalla, 58.

168 Simon Newcomb, "The Optical and Psychological Principles Involved in the Interpretation of the So-Called Canals of Mars," *The Astrophysical Journal* 26, no. 1 (July 1907): 8.

169 Basalla, *Civilized Life in the Universe*, 60.

point of seeing double.¹⁷⁰ The result was a momentous fracture between professionals in the field, as well as the interested public for whom the idea of structures on Mars was far too stirring to the imagination to let go. In some cases, the split was acrimonious and personal: William Pickering, brother of the leading American astronomer of the time Edward Pickering, was fascinated by the planets and believed them to be the only thing really worth studying in space. Edward, on the other hand, was concerned by his brother's growing fixation with Mars canals and life on other worlds, which had led to professional criticisms of him and the Harvard astronomy program that he headed by association – so he made William return from his observations in Peru lest he cause further embarrassment.¹⁷¹

It should go without saying that the general public does not read academic journals. Some striking criticisms emerged of the alleged Martian canals, especially an experiment performed by E.W. Maunder and J.E. Evans. In this experiment, a class of about twenty British schoolboys were shown a circular disc much like Mars as it would appear in Schiaparelli's telescope, with the image blurred at the edges to replicate peripheral vision so that the boys might unconsciously render small, indistinct features as straight lines just as Schiaparelli was suspected to have done; the authors found that this was indeed the case, and that the pro-canal astronomers merely connected the dots, so to speak, to create networks of canals in the corners of their vision.¹⁷² With this experiment complete and published in 1903, the authors declared the “magnificent” canal theories sadly non-existent – but the pity was perhaps to them, as they published not in a popular science text for the public but in the monthly notices of the Royal Astronomical Society.

170 Basalla, 60.

171 Howard Plotkin, “William H. Pickering in Jamaica: The Founding of Woodlawn and Studies of Mars,” *Journal for the History of Astronomy* 24, no. 1–2 (February 1, 1993): 104–5, <https://doi.org/10.1177/002182869302400104>.

172 J.E. Evans and E.W. Maunder, “Experiments as to the Actuality of the ‘Canals’ Observed on Mars,” *Monthly Notices of the Royal Astronomical Society* 63 (June 1903): 488–99.

Schiaparelli hardly denied that his *canali* were the works of extraterrestrial beings. He knew well that there are on Earth no perfect straight lines that continue for hundreds of kilometres at a stretch, and his comparison to the Rhine betrays this deeper belief just by looking at how gnarled and twisted a river is over a long course. In his later writings, he was more overt: Martians must have made these canals, just as the Dutch engineered their land to reclaim it from the sea. Not only that, but the fact that these beings managed to create these massive works of engineering – far grander than their remarkable terrestrial equivalents – meant to Schiaparelli that Martians were highly-developed socialists, who united against the hostile environment of their planet for their collective good, a model for the fractured but promising human race of the nineteenth century.¹⁷³

Schiaparelli's theories, though popular, would only become universally-known through the work of American astronomer Percival Lowell beginning in the 1890s. Across three books of popular science – *Mars*, *Mars and Its Canals*, and *Mars as the Abode of Life* – he made passionate arguments that convinced many that Mars truly had a massive network of canals intended to irrigate the dry red planet with melted water from its polar ice caps.¹⁷⁴ Unlike previous advocates for extraterrestrial life, Lowell held a teleological, secular view of intelligent life: he believed that “as the brain develops, it must take possession of its world.”¹⁷⁵ In a highly advanced civilization., this planetary subjugation should make a clear mark on the landscape visible from afar, with his chief examples being deforestation, road and rail lines, and canals.¹⁷⁶ Therefore, close study of Mars – an ancient planet with a necessarily ancient civilization. – must reveal signs of its inhabitants' development that parallel in a huge scale what Lowell was seeing on his own planet.¹⁷⁷ This carried with it another potential benefit:

173 Basalla, *Civilized Life in the Universe*, 65.

174 Percival Lowell, *Mars and Its Canals* (New York: Macmillan, 1906), 366,
<http://archive.org/details/marsanditscanals00loweiaala>.

175 Percival Lowell, *Mars as the Abode of Life* (New York: Macmillan, 1908), 109.

176 Lowell, 109.

177 Lowell, 111–12.

by examining this older civilization., we could find a prophecy of what humanity’s socio-technological future must look like.

Lowell, making no reference at all to God, applied the modern scientific arguments of his day: a planet itself is a “life-producing body” with the Sun acting as a sort of cosmic gardener, proven by Earthly elements of matter being found in other atmospheres and in meteorites.¹⁷⁸ Just as Kepler’s walled towns and forts were the epitome of human engineering in his day, Lowell consciously compared the canals he saw across the surface of Mars to the great technological accomplishments he admired, the Suez and Panama canals.¹⁷⁹ Lowell’s description of these alleged Martian canals proved to be so enduringly popular that even when NASA’s Mariner IV spacecraft flew by Mars in order to study the planet, the mission report published in 1967 stated “nothing positive concerning the existence or lack of canals can be concluded on the basis of the Mariner IV photographs.”¹⁸⁰

His most famous book, *Mars and its Canals*, is dedicated to Schiaparelli, who he declared “the Columbus of a new planetary world.”¹⁸¹ Lowell took Schiaparelli’s theory to new heights of popularity, cementing the idea of Mars as Earth’s elder counterpart in the minds of the public. An energetic and eccentric Bostonian with a one-track mind that fixated first on the Far East and then on Mars with equal intensity, he became indelibly associated with the canals of Mars. He had something of a gift for popular science writing and appealing to the public, and as an astronomer he completely captured the zeitgeist of the ongoing Mars mania that Schiaparelli had sparked. Lowell was such an avid advocate for the Mars canal theory that, in 1907, the *Wall Street Journal* preemptively declared that “the most extraordinary development [of the past year] has been the proof afforded by the astronomical

178 Lowell, *Mars and Its Canals*, 355.

179 Lowell, 180.

180 National Aeronautics and Space Administration, “Mariner-Mars 1964 Final Project Report” (National Aeronautics and Space Administration, 1967), 316, https://web.archive.org/web/20100519161531/https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19680009274_19680009274.pdf#page=324.

181 Dedication to Lowell, *Mars and Its Canals*.

observations of the year that conscious, intelligent human life exists upon the planet Mars.”¹⁸² Though no Martian had been spotted, the *Wall Street Journal* and many others were so convinced that, in their belief, it was only a matter of time until electrical signals or radio waves allowed Earthlings to communicate with their fellows on Mars. This was the beginning of a truly extraterrestrial, cosmic understanding of humanity on a wide scale.

The Mars canal era marked the high point of pre-Space Age interest in extraterrestrials and outer space as well as the end stage of the evolving intellectual currents around the plurality of worlds before the launch of Sputnik in 1957. By investigating Lowell, its figurehead, we can paint a vivid picture of this period of popular astronomy and how people of the time understood what it meant for there to be life on Mars.

Astronomy in the late nineteenth century was an increasingly complex and formal science defined particularly by photography and the spectroscope. Technological advances in these inventions allowed for a greater understanding of objects in the universe, with the spectroscope enabling the fields of astrophysics and astrochemistry to emerge and photography finally displacing the age-old practice of astronomers sketching what they saw through their telescopes – the epicentre of areography and the Mars canal debate.

Astrophysicists leading the ‘new astronomy’ of astrophotography and spectroscopy were, far more than the planets, interested in the stars. It was in stellar mechanics – their movement, origin, elemental properties – where some of the most exciting astronomical discoveries of the time were made. Spectroscopic analyses revealed a hitherto unknown element, helium, so named because it was found not on the Earth but in the Sun.¹⁸³ While Schiaparelli and others waited for the oppositions of Mars, these astronomers gazed in the opposite direction, observing solar eclipses in order to better understand the inner workings of the Sun and, through it, understand the origin of stars, solar systems,

182 “Mars.,” *Wall Street Journal*, December 28, 1907.

183 Becker, *Unravelling Starlight*, 268–69.

and perhaps the universe as a whole. One of the key debates on this other side of the astronomical fence was the nebular hypothesis, in which leading scientists like William Huggins argued that nebulae seen in space were actually proto-stars in an early stage of evolution before they emerged into full stars like our Sun.¹⁸⁴ This turned the categorization of stars into an important and hotly-contested arena, in which astronomers tried to figure out the correlation between a star's colour, heat, and age.¹⁸⁵ This led to the concept of the main sequence of stellar evolution in 1890, which more or less remains to this day.¹⁸⁶ The epochal theories of Einstein, Planck, and Bohr are founded on this branch of astronomy.

Astrophotography, true to its name, at this time largely focused on stars and nebulae, or what are referred to today as deep-sky objects. There are two main reasons for this: first, while turn of the century telescopes and cameras were capable of remarkable planetary imaging even by today's standards, physical observation alone contributed little at this point to major astronomical theories, and in the case of Mars, little could be captured.¹⁸⁷ Even with present-day technology, no Earth-based telescope can capture Mars in such detail as to make the planet's surface especially clear, and Lowell's photographs of the planet are small and blurry alone, only usefully interpreted through drawings.¹⁸⁸ Second, even aided by a telescope the human eye cannot see much detail in large, distant celestial objects like nebulae. With long exposure times to allow in more light than an eye ever could, and carefully tracking objects as they move in the sky, astrophotography allowed these objects to be seen with more detail and clarity than ever before. Perhaps the best contemporary collection of these photographs was published in 1899 by Isaac Roberts, whose stated goal was to use photography to answer two major questions: are the stars in the universe infinite in number and extent or not; and are

184 Becker, 269.

185 Todd, *A New Astronomy*, 370–71.

186 M. S. Longair, *The Cosmic Century: A History of Astrophysics and Cosmology* (Cambridge: Cambridge University Press, 2006), 34, <http://archive.org/details/cosmiccenturyhis0000long>.

187 For a fantastic contemporary photograph of Saturn, see the frontispiece to Percival Lowell, *The Evolution of Worlds* (New York: Macmillan, 1909).

188 Percival Lowell, "First Photographs of the Canals of Mars," *Proceedings of the Royal Society of London* 77, no. 515 (1906): 134, <https://doi.org/10.1098/rspa.1906.0010>; Later photographs were published for the public in Percival Lowell, "New Photographs of Mars," *Century Magazine*, 1907.

there universes [i.e. galaxies] beyond our own?¹⁸⁹ The ‘new astronomy’ was much less interested in the philosophical and evolutionary question of life on other planets; its ambitions were cosmological, seeking knowledge of the nature and origin of the whole universe. Lowell, and much of the public, were far more interested in simpler and more accessible ‘old’ astronomy and the idea of extraterrestrials.

Lowell’s evolutionary beliefs built upon Proctor’s similar understanding of the life and death of planets. For Lowell, it was a simple extension of theories about life on Earth: everything is born, grows, decays, and dies, and he understood the stars and planets in the very same way.¹⁹⁰ He compares the death of Earth from tidal friction to old age, its inevitable return to conditions alike those of its birth reminiscent of human senility, while planets like Jupiter “know nothing of some attributes of youth, like those unfortunate men who never were boys.”¹⁹¹ In Lowell’s belief, this blight of age had already struck Venus, whose face is fixed toward the Sun, while the Moon had suffered “heart failure,” that is, the loss of air and water that are necessary for life.¹⁹² Mars, he suggests, will eventually become a victim of this latter fate: perhaps an explanation of why the Martians built their canals, or in fiction sought to conquer Earth. It is a depressing perspective on the universe, although realistic, and commonly understood at the time for all the existential anxiety it may cause: “so in the march of worlds no retrace is possible of steps that once are past.”¹⁹³

Contemporary astronomers did not necessarily look fondly on Lowell. George Ellery Hale, a prominent solar astronomer, complained about Lowell’s “absolutely unscientific method of dealing

189 Isaac Roberts, *Photographs of Stars, Star-Clusters and Nebulae*, vol. 2 (London: “Knowledge” Office, 1899), 20, <http://archive.org/details/selectionofphoto02robeuoft> See also p. 62 for Roberts’ masterpiece, a photography of the Andromeda galaxy, which was then believed to be a “great” nebula; Edwin Hubble would prove it to be a separate galaxy from our own in the 1920s, another major cosmological discovery.

190 Lowell, *The Evolution of Worlds*, 213.

191 Lowell, 216, 218.

192 Lowell, 220, 233.

193 Lowell, 236.

with his material and of stating his case.”¹⁹⁴ Lowell’s association with William Pickering, who was something of a mentor to him, brought him criticism by astronomer Seth Chandler, who opined that Lowell ought to partner with “some young, well-equipped astro-physicist, sound and conservative, to sit on his coat-tails and keep him down to business, and prevent wild flights of fancy.”¹⁹⁵ Fond of fanciful metaphors and optimistic conjecture, Lowell did not fit well into the mainstream astronomical community of his day – but he could get away with eccentricity and had to be tolerated nonetheless because of his wealth, status, and popular acclaim. He doggedly – or dogmatically – pursued his personal vision of Mars, but always understood the crucial appeal to scientificism that grounded his work with some legitimacy: in 1908 he went so far as to pressure one of his junior astronomers at his observatory in Flagstaff, Arizona, Vesto Slipher, to interpret his spectroscopic findings about water vapour in the Martian atmosphere – which earlier researchers had found to be trace – more positively and strongly in order to support the life on Mars argument.¹⁹⁶ On another occasion, taking a stand against baseless sensationalism, Lowell published an article in the *Proceedings of the American Philosophical Society* that lights supposedly shone as signals from Mars seen in December 1900 were not Martian at all, offering rigorous mathematical and astronomical arguments against the feverish interpretations of the popular press.¹⁹⁷ When he announced his expedition to study the canals of Mars, Lowell knew well that this would be on the face of it a “chimerical search” to some of his professional fellows.¹⁹⁸

194 David H. Devorkin, “W. W. Campbell’s Spectroscopic Study of the Martian Atmosphere,” *Quarterly Journal of the Royal Astronomical Society* 18, no. March 1977 (1977): 43.

195 William Sheehan, *The Immortal Fire Within: The Life and Work of Edward Emerson Barnard* (New York: Cambridge University Press, 1995), 241.

196 Devorkin, “W. W. Campbell’s Spectroscopic Study of the Martian Atmosphere,” 43 Slipher, though in Lowell’s shadow until the latter’s death in 1916, would through his observation that far-away galaxies are moving away from us be imperative to the discovery by Edwin Hubble that the universe is expanding, a key precursor to the emergence of the Big Bang theory. .

197 Percival Lowell, “Explanation of the Supposed Signals from Mars of December 7 and 8, 1900,” *Proceedings of the American Philosophical Society* 40, no. 167 (1901): 166.

198 Sheehan, *The Immortal Fire Within*, 242.

Behind all of his scientifically-worded literature, Lowell only barely strays out of the realm of conjecture – the most tried-and-true sphere of debate among pro-pluralists – when discussing the supposed beings behind the Martian canals. The effort that he places on arguing for his physical evidence in the form of canals is proof of just how precious it was to the extraterrestrial life debate post-Whewell: Lowell dedicates nearly 350 pages of his 1906 *Mars and its Canals* to pure argumentation for the canals’ existence with the barest mention of their creators; only his short final chapters discuss his assumptions about the life behind the canals. In these he declares that the green tinge seen on Mars reflects vegetation, and leaps from this to state that “the presence of flora is itself ground for suspecting a fauna.”¹⁹⁹ Rhetorically, Lowell shifts the reader’s perspective from thinking about whether this vegetation is real in the first place to assume its truth and begin a new argument about the proceeding life that must exist. He makes a simple comparison, noting that how looking down upon a terrestrial forest or moorland from a great height would fail to reveal the great mass of creatures that live there: “unless man have marred the landscape not a sign appears of any living thing.”²⁰⁰ For Mars, the landscape was marred by the distinct and massive canals.

New scientific language and discoveries, like with Proctor and Leitch, make themselves home in Lowell’s writings about the red planet. In this he has an advantage: Whewell had to theologially imagine how life emerged on Earth, pointing to a divine creator, while Lowell has no such restriction. Indeed, reference to God is absent from Lowell’s writing on Mars, and astronomy generally by the end of the nineteenth century elided the role of God’s creative power and majesty in respect to the universe. His heavens and His many worlds, secularized, were now just dark space and empty planets. Instead, planets were part of the natural evolutionary system of the universe hinted at earlier by Proctor: for Lowell life is simply a matter of the correct conditions, and if those conditions exist, life will spring up,

199 Lowell, *Mars and Its Canals*, 349.

200 Lowell, 361.

organic from the inorganic, just as it did on Earth.²⁰¹ The planet itself, not God, is “the life-producing body,” aided by the Sun’s light.²⁰² Similarly, intelligent life is an inevitable outcome of this evolutionary process: “With another planet the like course must in all probability be pursued, and the older the life relatively to its habitat the more its signs of occupation should show.”²⁰³ In other words, there was no need for a Lockesian telescope that could see man-bats frolicking on the Moon; all that was needed was to look for signs of civilization., like Locke’s great lunar temples, and the older and thus more advanced a civilization. was the larger its signs necessarily would be. By arbitrarily establishing the definition of a true discovery of life on another planet – one that coincidentally privileges his argument for Martian canals – Lowell obscures the fact that even if his canals were not optical illusions, he has not seen any actual Martians. He has only seen straight lines that ebb and flow.

Ultimately it did not matter if Percival Lowell was ridiculed by the professional astronomical community, or if his arguments and observations held up to criticism: his popular appeal and public presence were unmatched by any other astronomer in his lifetime. In its obituary of Lowell, the *New York Times* cast aside his “contemporaries of distinction” who ridiculed his theories, declaring that his fresh observations and plausible arguments were yet to be disproved.²⁰⁴ It went so far as to suggest that he was a true scholar and no sensationalist; his insistence upon his arguments was not stubborn but brave in the face of criticism, and that what mattered most was that he had a great vision. A decade prior, the same newspaper had run a full-page article with fulsome illustrations and the imposing title “There Is Life On The Planet Mars” with Lowell credited as “the greatest authority on the subject.”²⁰⁵ In Boston, his death made front page news of the city’s largest and most prestigious paper, the *Boston*

201 Lowell, 354–56.

202 Lowell, 355.

203 Lowell, 364.

204 “Percival Lowell,,” *New York Times*, November 14, 1916, sec. Obituary.

205 Lilian Whiting, “THERE IS LIFE ON THE PLANET MARS: Prof. Percival Lowell Recognized as the Greatest Authority on the Subject, Declares There Can Be No Doubt That Living Beings Inhabit Our Neighbor World,,” *New York Times*, December 9, 1906, sec. SECOND MAGAZINE SECTION MUSIC DRAMA ART SOCIETY FASHIONS.

Globe, without any mention of his critics and instead an affirmation that Lowell’s “contributions to the astronomical field have been accepted the world over.”²⁰⁶ At this point, Lowell was so fundamentally connected to the Mars canal theory that he is credited by the *Globe* as its originator. Lowell’s ideas of superior Martians continued to hold sway after his death, earning another full-page illustrated article in 1920 in the *New York Tribune*.²⁰⁷ His reputation persisted: modern scientists writing on the history of the study of planetary formation – which Lowell theorized on fairly accurately for his time – described him as “the most influential popularizer of planetary science in America before Sagan.”²⁰⁸

Enthusiasm about life on Mars did not abate after Lowell’s death: he had planted the seed of a set of beliefs that, once rooted in the intellectual soil of the early twentieth century, found many other energetic advocates. These included radio pioneers Guglielmo Marconi and Nikola Tesla, scores of scientists and astronomers, and even Albert Einstein. Mainstream belief in the Mars canal theory, once unshakable, only faded away in the 1960s.

As early as 1901, Marconi and Tesla were eager to propose that the newly-harnessed radio signals could detect and communicate with extraterrestrial life. Tesla in particular was certain not only that extraterrestrial life existed, but that it was humanity’s destiny to come into contact with it: by the beginning of the twentieth century he saw that popular enthusiasm for this had “intensified... to such a degree that it seems as if it were destined to become the dominating idea of the century that has just begun.”²⁰⁹ He claimed outright to have received as-yet undeciphered signals from outer space, and saw an imminent future in which electrical communication between the planets was as commonplace as electric lamps in cities. Marconi also thought the question of a plurality of worlds was solved, as he

206 “Percival Lowell Dead in Arizona,” *Boston Globe*, November 13, 1916, Evening edition.

207 Arnold D. Prince, “Scientists, Agreeing Martians Are Super-Race, Believe That Planet May Be Signaling to Us,” *New York Tribune*, February 8, 1920.

208 Kevin Zahnle et al., “Emergence of a Habitable Planet,” *Space Science Reviews* 129 (March 1, 2007): 36, <https://doi.org/10.1007/s11214-007-9225-z>.

209 Nikola Tesla, “Talking With the Planets,” *Collier’s Weekly*, February 9, 1901, 4, <https://teslauniverse.com/nikola-tesla/articles/talking-planets>.

said in an interview on the subject of extraterrestrial messages: “It’s silly to say that other planets are uninhabited because they... are so different from the earth. If there were no fish in the sea we would say life there is impossible.”²¹⁰

When he was interviewed by London’s *Daily Mail* in January 1920 on the subject of radio, Einstein too expressed that “there is every reason to believe that Mars and other planets are inhabited,” believing that new technology would herald the beginning of an age of interplanetary communication.²¹¹ He expected this communication to be in the form of more easily-manipulated light rays rather than radio waves. These remarks were widely popularized, as by March even the local newspaper of a hamlet in rural Minnesota was discussing Einstein’s thoughts on Martian life.²¹² Meanwhile, in the Soviet Union, the 1924 science fiction film *Aelita* would open with the hook of mysterious Morse signals from Mars, inspiring a Leningrad engineer to build a rocket ship to bring proletarian revolution to the red planet.

Although severe evidence existed at the beginning of the century that Lowell’s canals were mere optical illusions, his successors continued to vigorously defend his theories well into the Space Age. Edison Pettit, writing in the journal of the Astronomical Society of the Pacific, the first American national astronomical society and now the largest in the world, explained in 1947 that the canals were simply difficult to see except in the excellent conditions at Lowell’s Arizona observatory, and were even more tricky to photograph.²¹³ In the same publication in 1955, another astronomer would further Lowell’s propositions and state that the canals might have been used for travel, comparing it to contemporary America’s booming railroad network.²¹⁴ Writing in 1957 for the American science

210 Orrin E. Dunlap, *Marconi: The Man and His Wireless* (New York: Macmillan, 1941), 266–67.

211 Albert Einstein, *The Berlin Years: Correspondence January-December 1921*, ed. Diana Kormos Buchwald et al., vol. 12, *The Collected Papers of Albert Einstein* (Princeton: Princeton University Press, 2009), 430.

212 “Hello, Earth! Hello!,” *The Tomahawk*, March 18, 1920, <https://chroniclingamerica.loc.gov/lccn/sn89064695/1920-03-18/ed-1/seq-6/>.

213 Edison Pettit, “The Canals of Mars,” *Publications of the Astronomical Society of the Pacific* 59, no. 346 (1947): 5–11.

214 Wells Alan Webb, “Analysis of the Martian Canal Network,” *Publications of the Astronomical Society of the Pacific* 67, no. 398 (1955): 292 The term “communication” is used here, which historically meant both physical transit between two points and speaking; this meaning is now archaic in English but is extant today in French and Russian.

magazine *The Scientific Monthly*, the same author again defended Lowell's canals, making a logical assumption that the late astronomer truly did see something on Mars as his and Schiaparelli's canals bore close resemblance to modern air traffic networks.²¹⁵ In the 1960s Carl Sagan – today more famous as a proponent of extraterrestrial life – began to publish arguments against the canals, suggesting they were in fact geothermal features and not artificial. Only in 1971, with the Mariner 9 mission's photographs of the Martian surface, was Sagan able to truly debunk the longstanding canal theory: the vast majority of the canals had never existed. Just as suggested 70 years prior, they had been an illusion all along.²¹⁶

How did this collective trick of the eye survive for so long? Was Lowell simply a talented charlatan who preyed upon a new idea with mass popular appeal? The theory of life on Mars could not have duped so many intelligent minds if it lacked both logical coherence and a passionate desire for it to be real, despite the growing arguments against its very foundation. One of the chief defenders of Lowell's ideas after his death, Wells Alan Webb, perhaps revealed why in his 1957 article: he describes opponents of canal theory as “conservative” astronomers.²¹⁷ In other words, it may have been that to be a “serious” scientist at the turn of the century, one dedicated to journal publications and less to public engagement, was seen as something of a dinosaur: modern scientists, from respected scholars like Einstein to outsiders like Tesla, were much more favourable to newspaper interviews and popular science. The conservatives, like Edward Pickering, understood them as fanciful and indulgent, generalizing based off of the fantastical imaginings of a select few on the topic of Martian life. It is no strange thing for an older generation to be dismissive of the keen interests of their younger successors.

Lowell himself in all likelihood was a true believer, especially so as he refused evidence that contradicted his core beliefs. All things, especially ideas, have a definite origin, and as George Basalla

215 Wells Alan Webb, “On the Rejection of the Martian Canal Hypothesis,” *The Scientific Monthly* 85, no. 1 (1957): 27.

216 Carl Sagan and Paul Fox, “The Canals of Mars: An Assessment after Mariner 9,” *Icarus* 25, no. 4 (August 1, 1975): 602–12, [https://doi.org/10.1016/0019-1035\(75\)90042-1](https://doi.org/10.1016/0019-1035(75)90042-1).

217 Webb, “On the Rejection of the Martian Canal Hypothesis,” 23.

notes Lowell was the sort to pick something up out of fervent interest and confidently and passionately declare himself an expert after two weeks.²¹⁸ With little to no background in professional astronomy, in 1894 he set immediately himself to building an entire observatory from scratch, having announced that there was extraterrestrial life to be found before he had even looked through his newly-minted telescope. He published his first book on the canals only a year later.²¹⁹ The instigator of all this passion and commitment was the French astronomer and spiritualist Camille Flammarion, whose Mars theories Lowell had read about shortly before beginning his love affair with the planet.²²⁰ So genuinely inspired was Lowell by the idea of life on other worlds, that he wrote a poem on the romantic theme of spaceflight and his hopes for Mars:

One voyage there is I fain would take
While yet a man in mortal make;
Voyage beyond the compassed found
Of our own Earth's returning round....²²¹

From Kepler to Lowell, the concept of extraterrestrial intelligence was the most captivating idea in popular writing about outer space – and probably remains so today. What began as a Christian theological argument caught massive public attention, and was hotly debated by some of the greatest European thinkers from the Enlightenment to the Space Age. They represented many spiritual and philosophical impulses and drew intense feelings from those who believed in them: the very idea of extraterrestrial life is tantalizing, because if such beings are found, they may answer many of our questions about ourselves: are humans uniquely sinful and in need of redemption? Or, in a secularized fashion: does rational intelligence necessarily lead to greed, strife, oppression, and violence? Can we overcome these seemingly natural inclinations, perhaps with the aid of these enlightened beings from a

218 Basalla, *Civilized Life in the Universe*, 71.

219 Percival Lowell, *Mars* (Boston and New York: Houghton, Mifflin and Company, 1895), <http://archive.org/details/mars02lowegoog>.

220 Basalla, *Civilized Life in the Universe*, 69.

221 Percival Lowell, quoted in Camille Flammarion, *Camille Flammarion's The Planet Mars*, trans. Patrick Moore (New York: Springer, 2015), xi.

wiser world? And, perhaps greatest of all: is consciousness something inherent to humanity, or does it exist elsewhere in the universe? Are we all alone, our Earth the only abode of life across trillions of stars, and our young species the only observers of this incredible, vast universe?

The idea of life on other worlds is a tenacious argument, because it successfully transitioned from argumentation based in scriptural interpretations to logical deductions founded on modern science using knowledge about the one planet we can physically observe. Lowell, in offering what was seemingly the first direct evidence of intelligent life on another planet, was building off of a widely-accepted conjecture that extraterrestrial life would resemble its terrestrial counterpart.

It is tenacious also simply because people wish to believe in it. No matter what arguments are raised, those in favour of the plurality of worlds will find some new way to frame their debate, just as they shifted their argumentation over the intellectually tumultuous nineteenth century, from the Herschels' claims of an inhabited Sun in an orderly world crafted by the hand of God to Proctor's vision of life in the solar system shifting and evolving from world to world to Lowell's secular, evolutionary Mars theory with its perfected and advanced race of Martians. There is little inspiration or wonder in an empty universe, after all – nothing to call the human spirit to strive further and farther.

For that reason it arguably remains the greatest source of popular and scientific interest in outer space to this day: telescopes search distant solar systems for Earth-like planets, and machines roam the surface of Mars to detect even faint signs of liquid water or life. After all, this argument bears with it a crucial implication: if life exists elsewhere in our universe, then there are other worlds which humans may someday inhabit, other conscious beings with whom we can relate. If out in the vast cosmos there can be found only empty, lifeless spheres, there would be little impetus to try to leave our own blue world for the stars.

Interlude: Another Life in Outer Space?

In 1994 a series of strange tiles appeared embedded in roads around downtown Baltimore, with a recurring cryptic message:

TOYNBEE IDEA
IN MOVIE '2001
RESURRECT DEAD
ON PLANET JUPITER²²²

Many more similar tiles, dubbed 'Toynbee tiles,' have been found across the United States and even as far as South America. Over the next two decades they sparked mass confusion and excited theorizing over the meaning and origin of the tiles.²²³ 'Toynbee' seemed to fairly straightforwardly reference Arnold Toynbee, one of the giants of twentieth-century historiography. The concept of resurrecting the dead on Jupiter is, in comparison, entirely out of left field.

The collective message of the Toynbee tiles dates back to at least the early 1980s, pronounced by James Morasco, who in 1983 was profiled by the *Philadelphia Inquirer* about Toynbee, 2001, and resurrection on Jupiter.²²⁴ Morasco mentioned that he was part of a group called the Minority Association, a small group by the reporter's record but with clearly great ambitions. Though obscure, a set of documentary evidence from the association's early history still exists.

222 Erifnam, *Toynbee Tile at Franklin Square 2002*, 2002, Photograph, 350 x 380 px, 2002, Wikimedia Commons, https://commons.wikimedia.org/wiki/File:Toynbee_tile_at_franklin_square_2002.jpg; Rob Hiaasen, "The Word on the Street Turns Cryptic," *Baltimore Sun*, October 19, 1994, <https://web.archive.org/web/20210224044146/https://www.baltimoresun.com/news/bs-xpm-1994-10-19-1994292134-story.html>.

223 Doug Worgul, "A SPACE ODDITY? Strange Kansas City Marker Part of World-Wide Mystery," *Kansas City Star*, September 6, 2003, https://web.archive.org/web/20040405064604/http://www.kansascity.com/mld/kansascitystar/living/special_packages/starmagazine/6693767.htm; Steve Weinik, "Why – What Is It?," Blog, *Toynbeeidea* (blog), accessed October 21, 2022, <https://toynbeeidea.com/why/>.

224 Clark DeLeon, "Theories: Wanna Run That One By Me Again?," *Kansas City Star*, September 5, 2003, https://web.archive.org/web/20040405211334/http://www.kansascity.com/mld/kansascitystar/living/special_packages/starmagazine/6702715.htm Originally printed in *The Philadelphia Inquirer* in 1983, and reprinted here in relation to the above article about Toynbee tiles in Kansas City.

These documents, largely typed and handwritten letters by Morasco, are remarkably revealing for two reasons: first, they highlight of course the ‘Toynbee’ aspect mentioned in 1983, explicitly suggesting that Toynbee argued for the colonization of outer space.²²⁵ Across all of his oeuvre, Toynbee never wrote anything about colonizing outer space or resurrecting human beings on Jupiter. He did, however, talk fairly extensively about resurrection and – perhaps unusually for a historian, one might think – extra-sensory perception.

In one chapter of his autobiography, *Experiences*, published in 1969, Toynbee describes his beliefs regarding religion and humanity’s place in the universe. Having surveyed the historic ‘great’ religions of Christianity, Islam, Buddhism, and Zoroastrianism, Toynbee finds them all unsatisfactory and produces his own hypotheses about the ultimate question these belief systems attempt to answer: the distinction between the human body and the human spirit. In Toynbee’s view, based out of scientific evidence, both body and consciousness are themselves a part of the whole universe, comprised of atoms that, upon the death of the human organism, disperse throughout the cosmos.²²⁶ He then briefly discusses resurrection, which he expresses doubts about as there is no scientific evidence for it, nor for disembodied souls living on: although, he suggests, some humans may lack a rational, conscious spirit, there are no verifiable cases of consciousnesses persisting without a human form to occupy.²²⁷

This is the extent of Toynbee’s “idea” regarding resurrection – certainly no mention of Jupiter. After having argued that the body and spirit have a psychosomatic unity, Toynbee explains one religious-scientific belief he does hold, that “first-hand evidence has convinced me that extra-sensory perception is a reality.”²²⁸ Toynbee does not seem to assume that his reader may imagine this as absurd, or would come at him armed with accusations of pseudoscience. It is, here, a rational explanation of a

225 James Morasco, “Minority Association Documents” (Steve Weinik), 5, accessed October 23, 2022, http://steveweinik.com/Minority_Association_Documents.pdf Letter to Alexander Solzhenitsyn, under the name “Severino Verna.”

226 Arnold Toynbee, *Experiences* (New York: Oxford University Press, 1969), 139.

227 Toynbee, 140–41.

228 Toynbee, 142.

human quality that offers evidence of embodied spirits communicating with one another. In his case, he offers an anecdote about how his father-in-law Gilbert Murray was, through “numerous successful experiments,” able to recall various real and fictitious scenes that his daughter Rosalind recounted to others in a room when Murray was in no way able to hear or otherwise perceive what she was talking about.²²⁹ This, for Toynbee, is further evidence that the Universe has both a physical and a spiritual aspect to it. Human beings, then, are points in physical-spiritual space-time where both of these qualities intersect in particular ways to give organic and spiritual life to individuals.

The strangest aspect of the ‘Toynbee idea’ then is not that it refers to no idea Toynbee in fact held: it is that Toynbee himself, who comes close to mentioning it in detail, does not – but Morasco, bringing resurrection on Jupiter into the mix, filled in a crucial detail.

The theories put forward by Toynbee and Morasco are not outliers: similar ideas dominated popular thought about outer space into the middle of the twentieth century, with their collective roots in the writings of Swedish mystic Emanuel Swedenborg who had a series of visions beginning in the middle of the eighteenth century. Swedenborg claimed to have communicated with the spirits of the dead, who travel through outer space to and from the different planets – and by Swedenborg’s own testimony, a living person could make these same journeys while asleep. In particular he believed that “among the best of all spirits” in our solar system are from Mars, and that the inhabitants of that planet were closest to angels, as they communicated through pure thought: “They do not know what hypocrisy is, or what fraudulence and deception are.”²³⁰

Compared to mainstream Christian theology, Swedenborg’s conception of the afterlife was shocking: he held that heaven, with its attendant angels and spirits, existed in the physical universe alongside ourselves.²³¹ Even if they originate from other worlds, however, these angels and spirits are

229 Toynbee, 141.

230 Emanuel Swedenborg, *Other Planets*, trans. George F. Dole and Jonathan S. Rose (West Chester, Pennsylvania: Swedenborg Foundation, 2018), 49–50.

231 Swedenborg, 5.

not exactly “alien” so to speak, in Swedenborgian theology; they are ultimately human like ourselves, but without distinct physical form. Being untethered to bodily life these spirits are free to move around the universe, and though they tend to reside close to the planet where they experienced their material life, they can freely travel around the universe to communicate with other spirits.²³² Embodied souls, like Swedenborg himself, can learn to access their “deeper levels” with faith in God and can speak with spirits living in the afterlife, and indeed this was apparently very common for early humans before the emergence of languages. The latter part of these ideas bear a fair resemblance to Toynbee’s conception of extra-sensory perception and communication as well as the psychosomatic unity of body and soul, and form an important basis not only for the later nineteenth-century belief in spiritualism, but also the association of the world of spirits with outer space and life on other worlds. Swedenborg certainly did not have scientific-technical spaceflight in mind when he wrote down these ideas, but nonetheless later movements would take Swedenborg’s ideas and interpret them in varied and important ways.

His peculiar ideas about the afterlife, communication with the dead, extra-sensory perception, and reincarnation had immense influence on nineteenth-century thought, including beliefs about outer space and especially Mars. Much like the debate around extraterrestrial life, from the 1820s to the 1920s the arguments for these core ideas grew less mystical and more scientific. By the early twentieth century these ideas were mainstream, and in some form or another the pioneering rocket scientists – Robert Goddard, Wernher von Braun, Hermann Oberth, and Konstantin Tsiolkovsky – all held such seemingly-esoteric beliefs and found inspiration in them to realize spaceflight.

These beliefs, though they are unusual to us in the present day, should not be confused with superstition. They are recognized now as pseudoscience but were commonly accepted in this time period, and so it is important to understand them in the mindset of contemporary thinkers. Crucially, these beliefs sought to answer one of the most pressing questions of human existence: what happens to

²³² Swedenborg, 3–4.

our consciousness after death? Our only analogue is sleep: an unconscious state of dreams after which we remember little or nothing – so in this sleep of death, what dreams may come? We have a seemingly unique perception of the universe, able to rationally contemplate it and understand its physical laws. People of this era believed that, eventually, science could provide explanations for all natural phenomena, including consciousness and death. The idea of reincarnation in its various forms was an especially popular preliminary answer to this ultimate question; by the end of the nineteenth century, it had become deeply bound up with ideas about outer space.

The following chapter, in two sections, will examine how these ideas evolved in two main branches, as seen in both fiction and popular scientific literature: first, the Anglophone spiritualists, and second, the Francophone spiritualists. For clarity's sake, “spiritualism” and “spiritualist ideas” here will refer to the ideas of reincarnation, communication with the dead, and extra-sensory perception in all their forms. Similarly, “reincarnation” will be used as a collective synonym for the ideas individually expressed by various writers as reincarnation, metempsychosis, palingenesis, rebirth, and resurrection.

The first part will explore the American and British branch of spiritualism, which arose around the 1820s out of a mix of the ideas of Swedenborg and extraterrestrial thinkers, finding its earliest popular expression in the Christian sects of Mormonism and Adventism. The spiritualist movement proper began in the 1840s in New York, spreading rapidly after the American Civil War across the United States and Britain, attracting a diverse set of devotees including Ralph Waldo Emerson and Arthur Conan Doyle. It remained largely unchanged until the late nineteenth century, when French spiritualist ideas – heavily infused by mystical beliefs about outer space – merged with popular enthusiasm about Mars. At the same time, American writers in particular were increasingly considering what the future might look like: before the Mars craze these visions were exclusively set on our planet, imagining science-fiction utopias built by socialist societies in the far future. After Mars captured mass

public interest these utopias shifted into outer space, adopting French ideas about a transcendent and cosmic future.

The second part will follow the development of these French ideas, from their early expression by the socialist Charles Fourier to their adoption of American spiritualist practices under Allan Kardec and their ultimate influence on Russian cosmism. It will conclude by showing how the French family of spiritualist ideas mixed with the Anglophone push towards scientific validity to create a transcendent and utopian vision of outer space, one that directly inspired the early rocket pioneers to create the modern Space Age.

These spiritualistic beliefs, alongside a belief in positive human progress and scientific knowledge, germinated the now-ubiquitous idea that the destiny of humanity is to journey to the stars. In other words, spaceflight is not an explicitly scientific or even romantic-adventurous phenomenon, but the product of spiritual beliefs acting as a framework for understanding an era of unprecedented social and technological change.

Chapter 2.1: Mysticism Meets Science Fiction

*Now while the great thoughts of space and eternity fill me I will
measure myself by them,
And now touch'd with the lives of other globes arrived as far
along as those of the earth,
Or waiting to arrive, or pass'd on farther than those of the earth,
I henceforth no more ignore them than I ignore my own life,
Or the lives of the earth arrived as far as mine, or waiting to arrive.*

*O I see now that life cannot exhibit all to me, as the day cannot,
I see that I am to wait for what will be exhibited by death.*

Walt Whitman, "Night on the Prairies."²³³

From the beginnings of the idea of a plurality of worlds, two daunting questions haunted Christian theology. First: if the universe is physical space filled with stars and planets, then where or what is heaven? Second: if life exists on these other celestial bodies, then why did God place Christ's sacrifice and resurrection on this particular one?

In 1758 Emanuel Swedenborg had provided partial answers to both: for the question of heaven, he created multiple dimensions: a natural world, inhabited by living beings like ourselves; a spiritual world, overlapping ours, inhabited by the spirits of the dead; and a celestial world where God resides with angels, who live a life much like our own, whose inhabitants can choose to visit the other worlds at will.²³⁴ For the second question, his explanation of why God chose the Earth to bear his son and his divine word are fairly straightforward: on Earth there existed from early times writing as well as the ability to spread it across the globe through commerce and travel over land and sea.²³⁵ There is no deeper theological reason for this, and it is one of Swedenborg's points that would be more fully developed by later Christian thinkers. At the same time, it carries the direct intent that, at least in spirit

233 Walt Whitman, "Night on the Prairies," in *Passage to India* (New York: J.S. Redfield, 1871), 111–12.

234 Emanuel Swedenborg, *Heaven and Its Wonders and Hell*, trans. John C. Ager (West Chester, Pennsylvania: Swedenborg Foundation, 2009), 27–28,

https://swedenborg.com/wp-content/uploads/2013/03/swedenborg_foundation_heaven_and_hell.pdf.

235 Swedenborg, *Other Planets*, 66.

form, those especially in touch with the divine can spread the word of God, as Swedenborg did, to other created worlds, and similarly those extraterrestrials can travel spiritually to Earth to receive the word of God at its origin-point.²³⁶

After the end of his earthly life, Swedenborg's worldwide followers, the Swedenborgians, were a major source of inspiration for new Christian movements, particularly those of America's Second Great Awakening in the 1820s-1840s, chief among them Mormonism and Seventh-Day Adventism. These religious movements interacted with some of Swedenborg's core ideas: an afterlife in the physical universe and the theological implications of humans on other worlds.

There is a clear line of influence from Swedenborg to Joseph Smith. In recent times this has become a controversial topic, as evidence for Swedenborg's theology on Mormonism has been co-opted as anti-Mormonism, and opposed by anti-Swedenborg apologia from Mormons.²³⁷ However, Joseph Smith was certainly aware of Swedenborg: not only were his ideas immensely popular, early Mormon documents reference encounters between themselves and adherents of Swedenborg.²³⁸ Both share a conception of a tripartite heaven: Swedenborg in his seminal *Heaven and Hell* describes three concentric heavens, ranging in holiness from the innermost "celestial" heaven, the middle spiritual heaven, and the outer natural heaven.²³⁹ This mirrors the Mormon cosmology of three degrees of glory, described in the *Doctrine and Covenants*, consisting of a comparable celestial, terrestrial, and

236 In Swedenborg's conception, God has no permanent form, and has only physically manifested in the form of Jesus, making Earth special. Because of this, Earth becomes a site of pilgrimage for spirits across the universe: God has only appeared to them briefly in angelic apparitions. See Swedenborg, 68.

237 For an example of this comparison from an academic, pro-Mormon source, see J.B. Haws, "Joseph Smith, Emanuel Swedenborg, and Section 76: Importance of the Bible in Latter-Day Revelation," in *The Doctrine and Covenants, Revelations in Context* (Provo and Salt Lake City: Religious Studies Center, Brigham Young University, and Deseret Book, 2008), 142–67; For usage of Swedenborg in anti-Mormonism, see Vernal Holley, *Swedenborg and the Book of Mormon* (Roy, Utah: self-published, 1999).

238 Isaac Galland to Joseph Smith et al., "Letter from Isaac Galland," Letter, July 24, 1839, <https://www.josephsmithpapers.org/paper-summary/letterbook-2/75>; Haws, "Joseph Smith, Emanuel Swedenborg, and Section 76: Importance of the Bible in Latter-Day Revelation," para. 4.

239 Swedenborg, *Heaven and Its Wonders and Hell*, 28–29.

“testial” set of heavens.²⁴⁰ The contention is that Swedenborg’s influence here implies that Joseph Smith’s divine revelation was essentially plagiarized, but as Haws argues, many of these new Christian movements of the time shared a broad set of ideas that included such themes as three heavens, spiritual communication, and life on other worlds.²⁴¹

A slightly later product of the Second Great Awakening, Seventh-Day Adventism tackled the issue of cosmic-scale salvation and life on other worlds by hewing slightly closer to Swedenborg’s understanding of spirits. In Adventist theology, the Fall of Man of Abrahamic tradition was a strictly terrestrial event: of all the worlds being intelligent life in God’s universe, Satan claimed Earth, and thus it was here that the story of redemption through Jesus Christ’s sacrifice would decide the battle between good and evil, a cosmic lesson to “vindicate the character of God before the universe.”²⁴²

Unlike Mormonism, however, Adventist belief painted a much more concretely otherworldly vision of heaven: Ellen G. White, prophetess and co-founder of the movement, described having a vision of extraterrestrial beings, who were “noble, majestic, and lovely,” and “bore the express image of Jesus,” a reflection of an otherworldly society ordered according to the exact commandment of God.²⁴³ White imagined, like Joseph Smith, that God’s other creations were fundamentally human, but she went a step farther and, according to this same vision, was told by an attending angel that “if you are faithful, you, with the 144,000, shall have the privilege of visiting all the worlds and viewing the handiwork of God,” escaping the “dark world” of a sinful Earth.²⁴⁴ Compared to Mormonism we see in Adventism a gradual evolution in belief from a heaven separate from the observable world to one that

240 Joseph Smith, “The Doctrine and Covenants of the Church of Jesus Christ of Latter-Day Saints,” 1835, sec. 76, https://en.wikisource.org/wiki/The_Doctrine_and_Covenants.

241 Haws, “Joseph Smith, Emanuel Swedenborg, and Section 76: Importance of the Bible in Latter-Day Revelation,” paras. 2–3.

242 Ellen G. White, *Patriarchs and Prophets, or: The Great Conflict Between Good And Evil* (Toronto: Review and Herald Publishing Co., 1890), 68–69.

243 Ellen G. White, *Early Writings* (Hagerstown, Maryland: Review and Herald Publishing Co., 2000), 40.

244 White, 40.

is, implicitly, part of the same fabric of space as our own universe, more similar to Swedenborg's conception of spiritual and natural worlds.

This system of ideas crystallized with the spiritualist movement that flourished from the middle of the nineteenth century to the beginning of the twentieth in the United States and Britain. Spiritualism was a decentralized set of beliefs, and as such different believers emphasized different aspects of the core ideas of extra-sensory perception and communication with spirits, ultimately passed down from Swedenborg and his adherents. Spiritualists were well aware of the debt they owed Swedenborg: in his thorough history of the spiritualist movement, Arthur Conan Doyle placed the origin of spiritualism with Swedenborg, who he praises highly: in order “fully to understand Swedenborg one would need to have a Swedenborg brain, and that is not met with once in a century.”²⁴⁵ Ralph Waldo Emerson, arguably the most influential American writer of the nineteenth century, included Swedenborg in his lectures on seven “representative men” of history, whom he believed had become aware of all the wisdom he had accumulated after countless reincarnations.²⁴⁶

Spiritualist practice percolated in the social background of mid-century British and American history at this point, finding popularity, albeit in a disorganized and relatively ideologically mundane form, in its seances and talking boards.²⁴⁷ Some thirty spiritualist groups were meeting in the city of Philadelphia alone in 1853, with 30,000 mediums operating across America.²⁴⁸ Just as the civil war was likened at the time to a family fighting with itself – the literal and figurative “house divided” – communication with the dead was chiefly important to those who had lost family, particularly children, to untimely death.²⁴⁹ Along with communication, spiritual mediums also claimed to answer the question

245 Arthur Conan Doyle, *The History Of Spiritualism*, vol. 1 (London: Cassel and Company, 1926), 2, <http://archive.org/details/in.ernet.dli.2015.221709>.

246 Ralph Waldo Emerson, *Representative Men: Seven Lectures* (Leipzig: Bernhard Tauchnitz, 1907), 98–99, <http://archive.org/details/representativem00emergoog>.

247 Doyle, *The History Of Spiritualism*, 1926, 1:151.

248 Drew Gilpin Faust, *This Republic of Suffering: Death and the American Civil War* (New York: Alfred A. Knopf, 2008), 181, <http://archive.org/details/thisrepublicofsu0000faus>.

249 Bridget Bennett, ““There Is No Death“: Spiritualism and the Civil War,” in *Transatlantic Spiritualism and Nineteenth-Century American Literature* (New York: Palgrave Macmillan, 2007), 148.

of the place and conditions of those who were dead, placing them in a state of “spiritual materialism” in which the spirits of the dead were untethered and capable of free and instant movement through the physical universe, as explained in immensely popular contemporary novels like Elizabeth Stuart Phelps’ *The Gates Ajar*.²⁵⁰

This was a departure from the earlier faiths of the Second Great Awakening which were, ultimately, based on prophetic vision and divine revelation; this fundamentally came into conflict with the basis of spiritualism, which gained popularity in part because anyone could take part in the revelatory nature of spiritual communication, fulfilling a desire in the American and British public for a rational religion that could be tested by the standards of modern science.²⁵¹ Finally, Anglophone spiritualism, at least in this early period, largely de-emphasized bodily reincarnation despite its main attraction being communication with the dead, even as others placed “heaven” in the physical realm of outer space.

Ideas about reincarnation and the plurality of worlds shared a similar intellectual evolution towards the turn of the twentieth century, as seen in the first chapter: just as popular writing around extraterrestrial life increasingly came to use new scientific theories and discoveries in its argumentation and less so theology, so too did arguments for spiritual communication and reincarnation increasingly lean on their supposed scientific validity.

An 1880 volume collecting nearly 5000 individual works on the question of life after death – by that point already in its tenth edition – purported to describe a new type of Christian thought.²⁵² Where orthodox Christianity was irrational, bigoted, and superstitious, this new branch of thought was based in reason, liberty, and science. A well-formed and scientifically-backed argument was, in a sense, a

250 Elizabeth Stuart Phelps, *The Gates Ajar* (Boston: J. R. Osgood and Company, 1873), 124–25 As per Faust, Phelps’ novel was reprinted 55 times within twenty years of its publication in 1868.

251 Faust, *This Republic of Suffering*, 180.

252 Preface to William Rounseville Alger, *The Destiny of the Soul: A Critical History of the Doctrine of a Future Life*, vol. 10 (Boston: Roberts Brothers, 1880), <http://archive.org/details/destinysoulacri00abbogoog>.

piece of the divine – and spiritual beliefs could thus be proven with modern science, rather than standing opposed to them. The critical approach found here illuminates popular beliefs of the time in an effort to dispel them.

The author of this text, William Rounseville Alger, was a Unitarian minister from Massachusetts, and in the course of his criticism of various doctrines of the future of the soul beyond death touches on the idea of extraterrestrial beings, past lives, and physical reincarnation. Alger argues, “God can give us wings upon our bodies, and enable us to fly on an exploring trip among the planets. Will he do it? The question, we repeat, is not whether God has the power to raise our dead bodies, but whether he has the will.”²⁵³ While Alger does believe in a plurality of worlds, he is firmly against the suggestion that souls resurrect on them along a sort of interplanetary spiritual journey: “The figment of a judicial transportation of the soul from one place or planet to another, as if by a Charon's boat, is a clattering and repulsive conceit, inadmissible by one who apprehends the noiseless continuity of God's self-executing laws. It is a jarring mechanical clash thrust amidst the smooth evolution of spiritual destinies...”²⁵⁴

Much as the debate around extraterrestrial life proved how popular a subject it was, that Alger chooses to write on subjects like the end of the world and resurrection on other planets illuminates that they, too, were popular enough to earn a critical argument in opposition to them. Much as arguments for life on other worlds grew more publicly popular yet less legitimate in professional astronomy and academia towards the end of the nineteenth century, however, ideas of reincarnation and communication with otherworldly spirits only grew in popularity. This belief filled a spiritual and aesthetic void that more traditional forms of belief seemingly failed to.

At the same time, American writers began to more actively discuss salvation on our Earth, through means of social change rather than spiritual escape after death. To be sure, this salvation was to

253 Alger, 10:499.

254 Alger, 10:604–5, 61–62.

take place after the deaths of those imagining it: these writers built utopias far in the future, penning works of science fiction that combined a belief in the idea of human progress and utopia.

At the end of the nineteenth century, the most popular book in America was not the Bible or the works of Shakespeare but a work of socialistic science fiction titled *Looking Backward: 2000-1887*, by Edward Bellamy. *Looking Backward* is a utopian story that imagines what an America of the then-distant future may look like, accounting for changes in technology and society. It offers a positive, egalitarian, and prosperous vision of the world to come at the dawn of the twenty-first century, contrasting with the problems of the present day to galvanize people to work to create a world like the one depicted in the novel.²⁵⁵ Millions read *Looking Backward* and many created ‘Bellamy Clubs’ across America with the intent to realize such social change, in some ways a continuation of the earlier American tradition, following various Christian sects and utopian socialists such as Charles Fourier, of creating utopian communities aiming to realize the perfect societies imagined by these authors.²⁵⁶

To summarize the content of *Looking Backward*, the protagonist, a young Bostonian named Julian West, falls asleep – the most common time-travel narrative device before H.G. Wells and his *Time Machine* – and wakes up in the year 2000, finding an America that has transformed into a socialist utopia with state-owned industries and property. The novel’s plot is essentially a dialogue between West and an inhabitant of this new world, Doctor Leete, offering questions back-and-forth about how this society works and how it was created out of the nineteenth century familiar to West and to Bellamy himself. This made it not just a work of fiction, but also a sort of how-to guide for contemporary readers to try to build the world of the year 2000 for themselves.

Bellamy’s America of 113 years in the future acts fundamentally as a response to the social, technological, and economic problems and promises of his own time. Bellamy, by the time he was in

255 Elizabeth Sadler, “One Book’s Influence Edward Bellamy’s ‘Looking Backward,’” *The New England Quarterly* 17, no. 4 (December 1944): 530–31, <https://doi.org/10.2307/361806>.

256 Mark Holloway, *Heavens on Earth: Utopian Communities in America, 1680-1880* (Mineola, New York: Dover Publications, 1966), 135.

his twenties in the 1870s, had witnessed the collapse of the early socialist labour movement in the United States.²⁵⁷ The 1880s saw intense conservative reaction against labour, epitomized by the 1886 Haymarket Affair in which a demonstration in favour of the eight-hour workday was bombed, killing four and injuring scores more – but it also saw the rise of “Knights of Labour” cooperative organizations, a new form of unions that at one point had hundreds of thousands of members.²⁵⁸

The influence of *Looking Backward* was immediate and striking: it sold nearly one thousand copies a day at the peak of its popularity, and at least 165 Bellamy Clubs emerged around the world within a decade of the book’s publication.²⁵⁹ By the late 1890s the Bellamy movement’s enthusiasm had dissipated, but it was only one part of a greater utopian era in nineteenth-century English literature that used science fiction to imagine a more perfect future than the present.

It is these other novels that are more crucial here, because for all his utopian dreaming Edward Bellamy seemingly did not think much of outer space as a part of the future – apparently he went as far as to state in 1892 that “there can be no more new worlds to be discovered,” emphasizing that his utopia existed only within the confines of the Earth.²⁶⁰ As Kenneth Roemer explains in his overview of late nineteenth-century American utopian fiction, these authors’ “concept of the ideal place was limited to America,” either in “virgin land” on the frontier or in the expanding urban landscapes of the country.²⁶¹

As the American western frontier officially closed in the 1890s just as the Mars craze was reaching its peak, however, this limitation of utopia and the ideal human future to Earth began to recede. American authors like A.I. Jones & Ella Merchant, Byron Brooks, and even the ultra-wealthy

257 Sylvia E. Bowman, *The Year 2000: A Critical Biography of Edward Bellamy* (Bookman Associates: New York, 1958), 87, <http://archive.org/details/year2000critical0000bowm>.

258 Bowman, 88.

259 Robert E. Weir, *Workers in America: A Historical Encyclopedia*, vol. 1: A-L (Santa Barbara, California: ABC-CLIO, 2013), 68–69.

260 Kenneth M. Roemer, *The Obsolete Necessity: America in Utopian Writings, 1888-1900* (Kent, Ohio: Kent State University Press, 1976), 41, <http://archive.org/details/obsoletenecessit0000roem>.

261 Roemer, 54–55.

tycoon and *Titanic* sinking victim John Jacob Astor IV shifted Bellamy's utopian and progressive visions into outer space. They no longer had to place utopias on Earth to present their conceptions of an ideal human society, but could use popular conceptions of life on other worlds as a believable facsimile of our own.

Jones and Merchant's *Unveiling a Parallel*, published in 1893, uses Mars as the setting for a feminist utopia. The protagonist flies in an airplane-like machine up to Mars and experiences an egalitarian and sexually-liberated society; the Martians presented here are physically and mentally superior to humans, much like angels, who had achieved perfection: "Their real was our highest ideal. The moral world was to them a real world; the spiritual world was to them a real world."²⁶²

Earth Revisited by Byron Brooks takes place on Earth in 1992, but plays an important role in integrating ideas about Mars, utopia, and spiritualism in American fiction. In this story, instead of falling asleep or using a machine to visit the future, the protagonist dies and is reincarnated a century in the future. Brooks' utopian America not only answers the question of what a future society should look – with advanced technologies like solar power, and state ownership of property *a la* Bellamy – but also the equally-pressing questions of life on other worlds and life after death. In Brooks' future timeline communication with the ancient and wise people of Mars is established at some point in the early twentieth century, coming quite late as "[Martians] have been trying to signal to us for centuries, but we were so stupid and so much absorbed in our own petty affairs, that we did not give them due attention."²⁶³ Here space travel, progress, and spiritualism are intrinsically linked in the text:

'I was so greatly surprised at learning that communication had been established with its inhabitants,' I replied, 'that I should not be more astonished if told that you already had a railroad to that sphere. You have bridged the gulf between us and the world of life below us, and now have spanned the space to the worlds above.'²⁶⁴

262 A.I. Jones and Ella Merchant, *Unveiling a Parallel* (Boston: Arena Publishing Company, 1893), 211.

263 Byron Brooks, *Earth Revisited* (Boston: Arena Publishing Company, 1893), 76.

264 Brooks, 94.

The novel concludes with an assertion of the truth of reincarnation: through science and religion, Brooks explains, we can understand the reality of a future life on Earth, as the characters in the story realize that the protagonist had a past life in the nineteenth century, that he has “consciously returned to earth” after death, “a living demonstration of the continued life of man!”²⁶⁵

As early as Odoyevsky’s *Year 4338* in the year 1835, writers had imagined humans in the future using outer space for its physical resources, and in John Jacob Astor’s *A Journey in Other Worlds*, this becomes a central theme. Astor’s space travel is achieved through anti-gravity vessels, and while Mars and Venus are found to be hardly suitable for human habitation, Jupiter is revealed to be a perfect world:

Looking at iron mountains, silver, copper, and lead formations, primeval forests, rich prairies, and regions evidently underlaid with coal and petroleum, not to mention huge beds of aluminum clay, and other natural resources... made his materialistic mouth water. ‘It would be joy and delight to develop industries here... we must organize a company to run regular interplanetary lines. We could start on this globe all that is best on our own. Think what boundless possibilities may be before the human race on this planet... when our insignificant earth is cold and dead and no longer capable of supporting life! Think also of the indescribable blessing to the congested communities of Europe and America, to find an unlimited outlet here!’²⁶⁶

Astor offers a rare but valuable colonial vision of a human future in outer space in which other planets are vital to humanity not for the wisdom of their inhabitants but for their natural resources and *terra nullius*. His future is not purely materialistic and technological, however: the protagonists eventually travel to Saturn, which they find is the host of reincarnated human spirits: “Nobody doubts nowadays that after death we live again; that being the case, we must admit that we live somewhere. Space... can be no obstacle to a spirit; therefore, why suppose they remain on earth?”²⁶⁷ This remarkable, technological idea of outer space shows that scientific progress and life after death were not opposed or unrelated, but ran in the same intellectual circles.

265 Brooks, 318.

266 John Jacob Astor, *A Journey in Other Worlds* (New York: D. Appleton and Company, 1894), 262.

267 Astor, 308.

Ideas of life after death and utopian futures abounded in American thought in the nineteenth century. While these ideas began, in the model of Swedenborg, with conceptions of extraterrestrial beings and a future life in outer space, cosmic ideas receded in American thought through the middle of the century before resurging at the end, into the twentieth. Utopias that were initially envisioned in the future of America on Earth shifted into outer space, on Mars and other planets, as popular fascination with the canals of Mars mingled with spiritualism to create a technological-utopian and spiritualistic conception of outer space.

As found in *Looking Backward* and other novels of its era, utopian thought was a popular way to express criticism about the present and optimism for the future, while readers expected to take it into their own hands to make these imagined societies a reality in the future. Science-fiction was about society as much as technology and adventure and was to a degree respectable compared to later eras, where pulp magazines and schlock fiction never lived to experience the reputation held by Bellamy and his contemporaries. These writers, broadly, believed that the twentieth century would be better, more just, and more beautiful than the exciting and tumultuous nineteenth. Future-fiction was imagining an achievable human destiny according to the tune of contemporary ideas; this includes social Darwinism, eugenics, and chiefly linear social-technological progress: things will only get more advanced and perfect, but what is imagined in fiction can only reflect the time in which it is written.

In his history of future-fiction, Paul Alkon quotes the French writer Felix Bodin on why science fiction had such a triumphant, popular effect in the nineteenth century: “the marvelous of the future is entirely believable, entirely natural, entirely possible, and on that account it can strike the imagination more vividly and seize it by way of realism.”²⁶⁸ Unlike the myths and fantasies of the past that so excited the Romantics, stories of the future could be achieved, they were

268 Paul K. Alkon, *Origins of Futuristic Fiction* (Athens and London: University of Georgia Press, 1987), 245.

real, and they offered an inspiration to create a better world. They mixed the world of the dream, Alkon writes, with the technically and realistically possible according to the beliefs of the time.²⁶⁹

This is the essence of both the theory of a plurality of worlds, as well as spiritualism. People at this time were more likely to be inspired by something, more likely to accept it as real and true, if it appealed to scientific rationality, social and technological progressivism, and moral improvement. This was an era that believed that humanity was perfectible, and in many cases that technology would be involved in this future perfection. Even with unfalsifiable beliefs like extraterrestrial life and communication with spirits, science was rallied as proof, however strained, for new systems of belief and new ways of understanding a vastly changing world.

²⁶⁹ Paul K. Alkon, *Science Fiction Before 1900: Imagination Discovers Technology* (Routledge, 2013), 6–7.

Chapter 2.2: Socialist Reincarnation, the French Cosmism

Outside the Anglosphere, Swedenborg's spiritualistic ideas took on entirely different forms. In French thought in particular, the proto-socialist philosophies of Henri de Saint-Simon and Charles Fourier intertwined a belief in reincarnation with Christian theology and Earthly utopianism far earlier than their American counterparts. By the middle of the nineteenth century this evolved into a truly cosmic vision of a human future in outer space, in which the dead reincarnate on the other planets of our solar system in varied guises. Combining belief in life on other worlds with life after death, by the end of the nineteenth century this French philosophy became the most widely influential conception of outer space, shaping public and intellectual visions of humanity's place in the cosmos from America to Russia.

Writers like Charles Fourier, Jean Reynaud, Allan Kardec, Camille Flammarion, and Louis Figuier mixed the political, scientific, and spiritual into an intellectual cocktail that, more than any other, placed a real impetus on the human destiny in outer space. Quite the opposite of their English counterparts, these thinkers began with the idea of reincarnation at the centre of their system of belief, and only later adopted aesthetics of American spiritualism like seances and spiritual communication.

Charles Fourier, the earliest of these figures, is best-known today as a foundational utopian socialist and early feminist thinker, influenced by the proto-socialist Henri de Saint-Simon. Much less known are his precise beliefs regarding utopia, which even in his day were considered strange enough by later socialists to jettison out of embarrassment and confusion.²⁷⁰ Few indeed remember Fourier for his grand claims that planets produce life on their bodies through sexual reproduction with each other,

²⁷⁰ Charles Fourier, *The Theory of the Four Movements*, ed. Gareth Stedman Jones and Ian Patterson (Cambridge: Cambridge University Press, 1996), x–xi; Friedrich Engels, writing 35 years after Fourier published his theories, was still bemused at the fact that in France there were still numerous followers of Fourier's "unintelligible mysticism," see Friedrich Engels, "Progress of Social Reform On the Continent," *The New Moral World*, 3, no. 19 (November 4, 1843).

and that the aurora borealis is a sign that the Earth is undergoing rut.²⁷¹ In Fourier's cosmology, humanity has a set lifespan of 80,000 years, of which 70,000 will be spent in utopian bliss before crumbling into decrepitude with the death of the planet.²⁷² Like his contemporaries in England, Fourier also believed that the Earth was not a very special planet, his evidence for this being the fact that Earth has no magnificent ring like Saturn, and therefore is one of the "most impoverished planets in the firmament."²⁷³

On particular belief that Fourier only briefly addresses in his *Theory of the Four Movements* is the future of humanity after the death of Earth: he does not simply leave it there, with humanity inexorably destined to die out, but promises that in the future a fertile comet will arrive in the solar system and germinate fresh life upon it as the newest planet, with our Earth becoming a moon of this successor-planet upon which we will reincarnate.²⁷⁴ This mirrors a memorable passage from the Bible, Isaiah 65:17: "See, I will create new heavens and a new earth. The former things will not be remembered, nor will they come to mind." In Fourier's philosophy, this resurrection is no longer the creative work of God the creator as it appears in Mormonism and Adventism, but a purely natural mechanism of the universe.

This particular aspect of reincarnation is something he details in his longer but much lesser-read work *Theorie de l'unite universelle*, which was referenced by English writers as late as the early twentieth century but since has become almost completely unknown outside France.²⁷⁵ Fourier specifically believed in metempsychosis, a rebirth of the same soul, derived from the greater soul of the planet itself, into a new body on a new world; the transmigrated souls would only have a vague

271 Fourier, *The Theory of the Four Movements*, 47.

272 Fourier, 40–41.

273 Fourier, 54.

274 Fourier, 55.

275 One such writer, J.B. Bury, writing in 1920 gave a summary of Fourier's reincarnation idea from *Theorie de l'unite universelle* and disparaged it as "silly speculations," see J.B. Bury, *The Idea of Progress* (London: Macmillan, 1920), 280–81.

memory of their previous planet.²⁷⁶ Fourier breaks from Swedenborg and the spiritualists, however, in the matter of communication with the dead: he simply thought it impossible and unreasonable, because if other-worldly souls could speak with us, they would immediately explain how to realize the utopian future in order to mitigate their suffering and ours.²⁷⁷ On the other hand, the extraterrestrial souls of the dead, would gain incredible abilities to live far more exciting lives than their earthly bodies had allowed, including eyesight capable of seeing all that is happening on the various planets of our solar system.²⁷⁸

As esoteric as his theories may be, it was not charlatanism: Fourier was disillusioned by the failure of the French Revolution to live up to its dreams, condemning French society of his time in a damning rhetorical question: “has there ever been a generation more politically inept than the one which has caused the death of three million young men merely to bring about a return of the prejudices it wanted to be free of?”²⁷⁹ He saw in the Napoleonic age a momentary but tragic setback to civilization, another episode in what he defined as a chaotic period of roughly 5000 years that would, in a very millenarian sense, transition into tens of thousands of years of prosperity and happiness – before the inevitable end of the world, of course. Much as the American spiritualists were impelled by the social catastrophe of the civil war, so too was Fourier inspired to seek meaning in a certain, beautiful future by the events of the French Revolution that he experienced first-hand as a young man.

The intellectual tradition of Fourier was continued into the middle of the nineteenth century by the socialist writer Jean Reynaud, who is today known for co-publishing with fellow socialist Pierre Leroux the *Encyclopedia nouvelle*, the nineteenth-century successor to Diderot’s original. Reynaud receives little mention in English-language sources, but curiously is profiled in a *New York Times*

276 Charles Fourier, *Theorie de l’unite universelle* (Saguenay, Canada: University of Quebec at Chicoutimi, 2001), 487, http://classiques.uqac.ca/classiques/fourier_charles/theorie_unite_universelle_t1/fourier_theorie_vol_1.pdf.

277 Fourier, 492.

278 Jonathan Beecher, *Charles Fourier: The Visionary and His World* (London: University of California Press, 1986), 330.

279 Fourier, *The Theory of the Four Movements*, 308.

article from 1878 – well after his death in 1863 – as a “mystic and philosopher” and praised for his unorthodox, almost Diogenean wisdom.²⁸⁰

Reynaud shared with his contemporaries a resolute belief in reincarnation inherited from their intellectual predecessors. He, like Fourier, combined spiritualistic doctrines of palingenesis with theories of a just and harmonious social order of the future. The Anglo-Irish writer J.B. Bury tried to explain why early French socialists had such a fixation on the mystical and on reincarnation in particular. Fourier’s reincarnation, he argues,

[R]emoves the radical injustice... the men of each generation are sacrificed and suffer for the sake of their descendants, but as their descendants are themselves come to life again, they are really suffering in their own interests. *They will themselves reach the desirable state to which the slow, painful process of history is tending.*²⁸¹

For the Anglo-Irish Bury, Progress was a historical process which certain generations struggle through in order to create a better world for a future they will never live to see. They stoically accept this injustice as a fundamental sacrifice of nature over the inexorable course of time; the idea of reincarnation upended this entire justification of history.

In 1840 Reynaud published his *Terre et ciel* and made a permanent mark on French thought about spiritualism and outer space. Unlike his contemporaries and predecessors, Reynaud made an attempt to fuse scientific knowledge and intellectual rigour to his belief in spirits and reincarnation. In his book he suggests that the universe is completely packed with living spirits, which he compares to atoms, so great in number “there is not even a gap in the universe to slip your finger through without meeting a spirit in its path” but are not as plainly visible as the stars and planets.²⁸²

It is in *Terre et ciel* that we see the closest approach yet to a philosophy outright stating that spaceflight is the destiny of humanity. Unlike Fourier, Reynaud shows that he has an astute understanding of astronomical matters, appreciating the universe as a physical as much as metaphysical

280 “Jean Reynaud, Mystic and Philosopher,” *New York Times*, July 14, 1878.

281 Bury, *The Idea of Progress*, 320, emphasis mine.

282 Jean Reynaud, *Terre et Ciel*, 4th ed. (Paris: Furne et Cie., editeurs, 1864), 393.

space, not just an abstract heaven.²⁸³ He sums up his philosophy in one of many succinct phrases: “We encounter nothing in the universe that cannot be used to elevate us, and we can only truly elevate ourselves with the help of what the universe offers us.”²⁸⁴ He believed, like his predecessors, in the innate perfectibility of humankind; and similarly, he believed that this perfection will be achieved “at the extremity of an infinite chain of which the earth constitutes one of the links, and of which the others must undoubtedly offer to our life, in a higher degree, analogous conditions to its present condition” – that is, physical reincarnation.²⁸⁵

Perhaps owing to the more semi-scientific nature of how he presented his ideas, even as he emphasized a divinely-created universe, Reynaud emerged as one of the most influential French writers on the subject of interplanetary reincarnation.

It was at this point, in the wake of Reynaud and the failed revolutions of 1848, that a somewhat different figure emerged on the mystic-occult scene in France: Allan Kardec – born Hippolyte Leon Denizard Rivail – the founder of the French spiritualist movement, Spiritism. Spiritism played a key intellectual role in the development of the ideas of French mysticism and American spiritualism, essentially reuniting their shared Swedenborgian principles after a century of mutual departure: Kardec took communication with the dead from American spiritualism, and combined it with the French predilection for reincarnation, creating a potent and popular mix: his first work, *The Spirits’ Book*, was published in 1857, and by 1864 was placed on the Catholic Church’s list of banned books, joining Swedenborg, Fourier, and Reynaud in this hallowed hall of influential European thinkers.²⁸⁶

Reynaud was particularly sacred and profound to Kardec. Kardec directly cited Reynaud as his predecessor, whose “intuition and presentiment” predicted the emergence of Spiritism through his

283 For an example of this, he discusses in some detail the astronomical details of Earth’s place in the solar system and how that affects conditions on its surface in Reynaud, 67–69.

284 Reynaud, 168.

285 Reynaud, 169.

286 Pope Leo XIII, *Index Librorum Prohibitorum* (Turin: Typ. Pontifica et Archiepiscopalis, 1892), 208 For particular reference on astronomical matters, the works of Kepler and Galileo were only removed from the Index in 1835.

adaptation of Fourier’s mystical socialist ideas on reincarnation through “probing infinity with science at hand.”²⁸⁷

Indeed, as soon as Reynaud had died Kardec reached out to the spirit world to contact him. Via Kardec’s mediums, Reynaud’s ghost states that his views as set out in *Terre et ciel* align perfectly with the goal of Spiritism, that is, to enable “the regeneration of mankind through a reasoned and investigated knowledge of past and future existences.”²⁸⁸ These answers, published in Kardec’s periodical *Spiritist Review*, performed a double-role of comforting the participants about the unknown of death while also confirming the doctrinal confluences of the plurality of *worlds* and the plurality of *existences*: after his bodily death Reynaud’s spirit is supposed to have communicated that “the celestial splendors unfolded before my eyes, shining at full power. My stunned eyes plunged into the greatness of those worlds whose existence and habitability I had affirmed.”²⁸⁹

He would publish further spiritual communications with Reynaud in his book about the afterlife and those who experience it, *Heaven and Hell*. The title is a deliberate reference to Swedenborg’s own *Heaven and Hell* on top of the continued references to Reynaud; Kardec here stresses that three different mediums spoke with Reynaud and none of them were in contact with one another, reinforcing the veracity of these conversations.²⁹⁰

Kardec was well aware of American spiritualism, and certainly took the practice of seances from Anglophone sources. In another issue of the *Spiritist Review*, he gave a critique of American spiritualism, particularly its rejection of reincarnation: according to Kardec, the reason for this rejection

287 Allan Kardec, “Jean Reynaud and the Start of Spiritism,” *The Spiritist Review*, no. August 1863 (1863), <https://mail.kardecpédia.com.br/en/study-guide/897/the-spiritist-review-journal-of-psychological-studies-1863/5464/august/jean-reynaud-and-the-start-of-spiritism>.

288 Allan Kardec, “The Spirit of Jean Reynaud,” *The Spiritist Review*, no. August 1863 (1863), <https://mail.kardecpédia.com.br/en/study-guide/897/the-spiritist-review-journal-of-psychological-studies-1863/5476/august/spiritist-dissertations/the-spirit-of-jean-reynaud>.

289 Kardec.

290 Allan Kardec, *Heaven and Hell*, trans. Darrel W. Kimble, Marcia M. Saiz, and Ily Reis, Second (Brasilia, Brazil: International Spiritist Council, 2006), 245 As a peripheral note, these Kardec citations themselves reveal the lasting worldwide influence of Spiritism: Kardec’s ideas survive today with an energetic base of followers in Brazil, who translate his works into many different languages for modern readers.

was that Americans could not accept the idea that a black person could be reborn as a white person, and vice versa.²⁹¹ By this point, however – though Kardec fails to mention, this is published during the American Civil War – Americans have begun accepting ideas of reincarnation to a slight degree, though not as intensely as in France.

At the same time, the spiritualists were themselves aware of Kardec. Doyle, in his history of spiritualism, notes the Spiritism of Kardec as the primary form of spiritualism in the Romance countries, whose “predominant feature is a belief in reincarnation.”²⁹² According to Doyle, by the early twentieth century spiritualists in England were mixed on the idea of reincarnation: some believed in it while many others did not, and as unlike spiritual communication it could not be empirically proven it was not included in the general canon of spiritualist beliefs.²⁹³ Alexander Aksakov, a Russian spiritualist, writing in the revealingly-named *The Spiritualist and Journal of Psychological Sciences*, declared Spiritism an intellectual dead-end as “the experimental method is altogether unknown in Spiritism; for twenty years it has not made the slightest intrinsic progress.”²⁹⁴ This, precisely, is the chief spiritualist resistance to reincarnation: its inability to be proven by science, the hallmark of the great and momentous ideas of the time – even as Spiritists themselves claimed science as offering evidence for their doctrine: in *The Genesis According to Spiritism*, Kardec repeats early French philosophical ideas that science and religion must work together to create a better future, and this same book has a general section including what amounts to a regular popular astronomy publication of its day summarizing up-to-date scientific knowledge of the solar system and beyond.

291 Allan Kardec, “Reincarnation in America,” *The Spiritist Review*, no. February 1862 (1862), <https://mail.kardecpédia.com.br/en/study-guide/896/the-spiritist-review-journal-of-psychological-studies-1862/5165/february/reincarnation-in-america>.

292 Arthur Conan Doyle, *The History Of Spiritualism*, vol. 2 (London: Cassel and Company, 1926), 168, <https://archive.org/details/in.ernet.dli.2015.218497/page/n9/mode/2up>.

293 Doyle, 2:173.

294 Alexander Aksakov, “Researches on the Historical Origin of the Reincarnation Speculations of French Spiritualists,” *The Spiritualist and Journal of Psychological Science* 7, no. 7 (August 13, 1875): 75.

Above all, Kardec hewed strongly to the principle of absolute progress put forward by his predecessors: he espoused the popular at the time belief that everything in the universe was subject to progress, including stars and planets. Just as humans were destined to create nations and use reason to advance morally, socially, and technologically to increase our dominion over our planet, so do planets themselves necessarily evolve toward life, and these much like humans may die but are reconstituted into other planets that develop life.²⁹⁵ Though the Anglophone spiritualists may have had their hangups with Spiritist reincarnation, Kardec and his followers explicitly made modern scientific ideas part of their spiritual doctrines, just as the proponents of a plurality of worlds did the same after Whewell. His piece on astronomy is here particularly worth mentioning: it was guest-written by none other than Camille Flammarion.²⁹⁶

Even more so than Richard Proctor, Camille Flammarion was the most popular astronomical writer in the nineteenth century, authoring more than seventy books, many of which were translated into a broad set of European languages in his lifetime, from English to Russian.²⁹⁷

Born in 1842, Flammarion's astronomical obsession was sparked at a young age; he witnessed an awe-inspiring total solar eclipse at age 5, and by age 11 was using opera glasses as a basic sort of binoculars to view the Moon. His mathematical skills, as well as a cosmic text titled *Cosmologie universelle*, earned him a place at the Paris Observatory. While working at the observatory under Le Verrier, the famous discoverer of Neptune, Flammarion found a new spiritual calling: Jean Reynaud's *Terre et ciel*.²⁹⁸ His subsequent writings on extraterrestrial subjects got him dismissed from the observatory, but Flammarion turned full-time to writing and by 1880 published his *Astronomie populaire*, which would go on to sell 131,000 copies in his lifetime, setting him financially for life.²⁹⁹

295 Allan Kardec, *Genesis According to Spiritism*, trans. Darrel W. Kimble and Ily Reis (Brasilia, Brazil: International Spiritist Council, 2009), 140–41.

296 Kardec, 398, 111.

297 Crowe, *The Extraterrestrial Life Debate*, 404.

298 Flammarion, *Camille Flammarion's The Planet Mars*, vi.

299 Flammarion, viii.

This book, one of the most influential works of popular astronomy of the nineteenth century, enthusiastically endorsed the idea of Mars as Earth's twin, bearing intelligent life more advanced than our own.³⁰⁰

Before this more scientific text, however, Flammarion had delved into the mystical with his first popular work, *La pluralite des mondes habites*, in 1862. Originally a slim volume of 54 pages, it proved so attractive to the French reading public that Flammarion expanded it after two years to 570 pages, and a year later already boasted at least twenty-four reviews.³⁰¹ It should not, however, be appreciated only for its content regarding extraterrestrials and astronomical science: one of the very first reviews of *La pluralite* was published in the *Spiritist Review*. In this review, Kardec notes that Flammarion was a member of the Spiritist Society of Paris, and had taken part in seances the year prior; these seances are also recorded in the *Spiritist Review*, with Flammarion acting as a medium to summon up the spirit of Galileo for conversation, an event which Kardec describes as “the initiation of a young medium.”³⁰² Later in 1863, Flammarion penned an article in the *Revue Francaise* titled “Spiritism and the Spirits” which much more explicitly than his astronomical works deals with Kardec's movement and its contemporaries in America and the rest of Europe, praising Spiritism particularly as being based on “facts and not speculative systems and adventurous opinions.”³⁰³

300 Camille Flammarion, *Popular Astronomy: A General Description of the Heavens*, trans. J. Ellard Gore (London: Chatto & Windus, 1894), 390 The translator's preface notes that the sheer volume of this work's sales are, by 1894, “probably unequalled among scientific books.”

301 Crowe, *The Extraterrestrial Life Debate*, 405.

302 Allan Kardec, “Bibliography: The Plurality of the Inhabited Worlds,” *The Spiritist Review*, no. January 1863 (1863), <https://kardecpedia.com/en/study-guide/897/the-spiritist-review-journal-of-psychological-studies-1863/5385/january/bibliography-the-plurality-of-the-inhabited-worlds>; Allan Kardec, “Cosmological Studies Parisian Society of Spiritist Studies - Medium Mr. Flammarion,” *The Spiritist Review*, no. September 1862 (1862), <https://kardecpedia.com/en/study-guide/896/the-spiritist-review-journal-of-psychological-studies-1862/5272/september/spiritist-dissertations/cosmological-studies-parisian-society-of-spiritist-studies-medium-mr-flammarion>.

303 Camille Flammarion and Allan Kardec, “Spiritism and the Spirits by Mr. Flammarion - Extracted from the *Revue Francaise*,” *The Spiritist Review*, no. April 1863 (1863), <https://kardecpedia.com/en/study-guide/897/the-spiritist-review-journal-of-psychological-studies-1863/5418/april/spiritism-and-the-spirits-by-mr-flammarion-extracted-from-the-revue-francaise>.

Unlike Reynaud whose ghost had to be conjured up in order to get a Spiritist confession out of him, in the French press Flammarion publicly professed his attachment to this philosophy – and was no less popular for it. He would also later write a novel, *Lumen*, which deals extensively with the topic of interplanetary reincarnation. This novel contains numerous remarkable ideas: disembodied spirits traveling faster than light to view the Earth’s past and their antecedent existences; immortality through faster-than-light travel; and communication between Earth and distant stars with beams of light, itself a scientific formulation of a literal conversation between the living and dead.³⁰⁴ He also offers the idea that souls, like bodies, are themselves made out of atoms: we now approach the ideas Toynbee was familiar with almost one century later.³⁰⁵ Like his socialist predecessors, Flammarion connects his vision of outer space with the sociopolitical problems back on Earth: “All this traffic to amass a little gold at the expense of others! Man taking advantage of his brother man! Castes, aristocracies, robbery and ruin, ambitions, thrones, wars! In a word, *personal interests*, always selfish, often sordid, and the reign of matter over mind.”³⁰⁶

Though Flammarion’s non-fiction works mostly consist of scientific and astronomically-informed arguments for the plurality of worlds, more so than his predecessors, they also include tidbits of ideas that take on new importance in the light of his spiritualism. He intermixed Fourier’s conceptions of the extinction of life on Earth, French mystical beliefs in reincarnation, the superiority of extraterrestrial beings, and life on other worlds within his texts, even as late as his great work that inspired Lowell, *La planete Mars*, stating in his conclusion there that astronomical observation of Mars “will bring us face to face with the greatest of all mysteries, the mystery of universal and eternal Life. Here we face sublime Truth, and come to terms with the Creation itself... But what does science hold

304 Camille Flammarion, *Lumen*, trans. A.A.M. and R.M. (New York: Dodd, Mead and Company, 1897), 123.

305 Flammarion, 195–96.

306 Flammarion, 174–75.

for the future? Will Martian and terrestrial humanity ever be in touch with one another? Progress continues on the march of its ascent...”³⁰⁷

Does he refer to distant communication between Mars and Earth in this last sentence as through a telephone, or does he refer to a physical touch? One evocative passage from his *Pluralite des mondes habites* stands out:

So once did a hardy navigator explore the oceans for a long time in accordance with his dream, searching for the land which had been revealed to him, piercing the most vast distances with his eagle-like gazes and audaciously exceeding the limits of the known world, until finally he wandered onto the immense plains where the New World had been resting for centuries. He realized his dream. May ours break out of the mystery which yet envelops it so that, on the ship of thought, we may sail up to the heavens and search there for other earths.³⁰⁸

Here he uses a tantalizingly vague allusion: he compares the astronomical search for life in the universe with the physical exploration of the New World by Europeans, then asks his reader to explore other worlds in outer space with him on a non-physical ship of thought. Without suggesting the technical means of interplanetary travel from Earth, Flammarion both puts the idea in his reader’s mind of a bodily expedition for other worlds while also drawing on spiritualist ideas of the exploration of outer space through the mode of the spirit.

At another point in his *Pluralite* he discusses the possible destruction of Earth by some geological catastrophe, and the implications that the plurality of worlds argument has for humanity’s long-term existence:

Now, after such reflections, can one still claim that this globe is, even for man, the best of all possible worlds, and that a great number of other celestial bodies cannot be infinitely superior to it, and bring together better than it conditions favourable to the development and long duration of human existence?³⁰⁹

307 Flammarion, *Camille Flammarion’s The Planet Mars*, 512.

308 Camille Flammarion, quoted in Crowe, *The Extraterrestrial Life Debate*, 408.

309 Camille Flammarion, *La pluralite des mondes habites* (Paris: Didier, 1868), 181, <https://gallica.bnf.fr/ark:/12148/bpt6k246240/f197>.

Fourier had already discussed the continuation of human life on a new planet after the death or destruction of the Earth; Flammarion would have been familiar with the concept, even if he did not explicitly suggest this for humanity's future in his own writings.

The final figure in this chain of mystical French intellectuals is Louis Figuier, whose work, like Flammarion's, derived more of its argumentative justification from science rather than faith. Figuier was another of the most popularly-read science popularizers in France in the late nineteenth century. His most prominent work, *The Day After Death; or, Our Future Life According to Science*, published in French in 1871 followed much of Flammarion's lead in the realm of spiritual-scientific thinking that developed in parallel with arguments for the plurality of worlds.

Figuier believed that reincarnation was part of a physical-moral cycle: when humans die, if they were under twelve months of age or if they were not fully enlightened people, they reincarnate on the same planet where they lived before. Noble souls, however, escape this physical reincarnation and become super-human beings, achieving something like a Buddhist nirvana in which while they have a physical form, have vastly superior senses, speed, and the ability to fly freely in outer space. These forms, however, are still mortal, and when they in turn die a human becomes even more perfect and spiritual, shedding more of their physical existence, until eventually they migrate into the Sun where they release solar rays that germinate life on Earth and the other planets. Much as Kardec made use of references to ancient Gallic druids in creating his Spiritist doctrine, Figuier justifies the centrality of the Sun as life-giver through reference to historical cultures and their sun worship, such as the Incas and the Persians, the latter of whom he notes – according to the understanding of the time – sailed to Europe and peopled that continent, as Aryans.³¹⁰

In *The Day After Death* Figuier is also careful to show that he is clearly abreast of modern science, engaging them with his own theories. As his philosophy of reincarnation states that souls

³¹⁰ Louis Figuier, *The Day After Death; or, Our Future Life According to Science* (London: Macmillan, 1904), 119–21, <https://www.gutenberg.org/files/55230/55230-h/55230-h.htm#EPILOGUE>.

evolve in complexity, from animals into humans, he brings up Darwinism as a similar but different idea. His key problem with Darwinian evolution is that it relies purely on anatomy – the similarity between humans and apes is naturally the chief example – with no reference to the most important aspect of life, that being the soul.³¹¹ Here, notably, he directly references Jean Reynaud as a philosopher of note on the evolutionary transmigration of the soul. Figuiet legitimizes his more scientifically-founded belief in extraterrestrial spirits by distancing himself from traditional spiritualism: he considers it a baseless superstition, as its core tenet – active, conscious communication with spirits that he dismisses as “table-turning” – is ignorant of the truth of super-human spirits: they can only be contacted during states of sleep, through dreams, as Swedenborg did.³¹²

Social science, in addition to biology, is where Figuiet evidently sees great use for his theories of reincarnation.³¹³ Reincarnation offers a solution to the eternal problem of injustice, the question, as Figuiet tellingly and colourfully puts it, of “Why was I born in Europe and in France, where, by means of art and civilization, life is rendered easy and endurable, instead of being born under the burning skies of the tropics, where, with a bestial snout, a black and oily skin, and woolly hair, I should have been exposed to the double torments of a deadly climate and social barbarism?”³¹⁴ The answer he gives is that humans are born into social conditions and bodies that offer us opportunities to ennoble and purify our souls, before they are ready to ascend as super-humans. Where Fourier argued that we must ameliorate life on Earth and abolish injustice so that our reincarnated souls can enjoy happier lives in the utopian future we create, Figuiet’s philosophy is conservative, saying that people are individually responsible for their own lives, and if they desire to be freed from the flaws of the human body and society they should improve themselves morally and bear mortal suffering in this life, to achieve perfection in outer space after death.

311 Figuiet, 253–54.

312 Figuiet, 124.

313 Figuiet, 219–20.

314 Figuiet, 202.

After Flammarion and Figuiet, ideas of interplanetary reincarnation become well-known outside France and influenced many thinkers in the English-speaking world. French socialist-mysticism had one other branch, however, which became arguably even more influential than its predecessor: Russian cosmism.

Russian cosmism originated with a simple librarian at Moscow's Rumyantsev Library named Nikolai Fyodorov. He was born in 1829 and did not see the publication of his body of work by the time of his death in 1903. His ideas, declaring that humanity's destiny is to become a technological, space-faring species and resurrect the dead, were circulating at least by the 1870s, at which point the eminent novelist Fyodor Dostoyevsky had been in contact with Fyodorov and found inspiration in his philosophy.³¹⁵

Much like his French counterparts, Fyodorov's writings are heavily steeped in mystical interpretations of Christianity.³¹⁶ In his view, humanity presently existed in an "unbrotherly state" that is detached from the lost common task of striving for God.³¹⁷ The resulting strife causes people to forget that the Earth has been the graveyard of thousands of generations, and is ultimately but one world among many others in the universe. The ultimate way to express this life-giving love for our ancestors is, naturally, to resurrect the dead and populate the planets of the universe.³¹⁸ Physical resurrection specifically is the ideal because, unlike popular ideas of scientific and social progress, it merges thought (the driver of progress) with action (the unifying common task) to enable human perfection.³¹⁹ Universal resurrection is the common task central to his philosophy, and to achieve it requires a revolution.

315 This contact is evidenced by a letter written by Dostoyevsky dated to 1876, see Nikolai Fedorov, *What Was Man Created For? The Philosophy of the Common Task*, trans. Elisabeth Koutaissoff and Marilyn Minto (Bath, UK: Honeyglen Publishing, 1990), 14.

316 Fedorov, 37.

317 Fedorov, 40–41.

318 Fedorov, 44.

319 Fedorov, 55–56.

A revolution, Fyodorov argues, not of “economic reform but a radical technical revolution bound up with a moral one.”³²⁰ Here he imagines, like his French predecessors, a union of religious morality and scientific accomplishment, and anticipates such innovations as wind and solar power. Fyodorov also imagined a world fully united, so that all territories of the Earth can be linked with railways, and be electrified with cables held aloft by airships and charged by thunderstorms. This way all of humanity would become dependent on one another, war would be abolished, and this unified society would “become the consciousness of the planet Earth.”³²¹

For all of his curiosity and knowledge about science and technology, however, Fyodorov lacked deeper scientific engineering knowledge and thus imagined spaceflight in a peculiar way. Fyodorov had likely read Fourier, and similarly to him believed that the planet Earth had a kind of spirit that took the present form of human beings. Rather than ascending to outer space on rockets or other devices and spreading throughout the universe, the whole of the human race would become “captain, crew, and maintenance staff of this Earth Ship.”³²² This human-piloted Earth would sail through the cosmos, and upon nearing other planets humans would start steering them around as well, living on them as we do on Earth. Because Earth is fundamentally a graveyard, containing countless dead humans, the common task of resurrecting humans and ensuring immortality for all would leave little room on Earth, mandating the population of other worlds and the transformation of them along the lines of what will be done to Earth, creating a whole fleet of planetary vessels.³²³

From Swedenborg through Flammarion we have witnessed several different forms of interplanetary afterlives, from the purely spiritual to the semi-physical and transcendental, but all those philosophers have been mostly interested in reincarnation, the successive perfection of humanity *after*

320 Fedorov, 62.

321 Fedorov, 70.

322 Nikolai Fedorov, “Astronomy and Architecture,” in *Russian Cosmism*, ed. Boris Groys, trans. Ian Dreiblat (New York: The MIT Press, 2018), 56.

323 Fedorov, 58.

death. Fyodorov, however, desired a much more material resurrection: he believed that if humans were able to fully understand and manipulate atoms, we could reassemble the molecules constituting the dead and also rearrange our own bodies, overcoming our basic physical limitations, like the inability to survive in a vacuum or fly, and become very much super-human but in this same life and not a future existence.³²⁴ Due to the common origin of the universe the atoms that constitute all humans who ever lived have since scattered throughout the solar system and perhaps even beyond, so spaceflight was doubly necessary in order to restore not only the bodies of the dead, but their living minds as well.³²⁵ It was not enough for Fyodorov to wait until death to achieve paradise and perfection in spirit-form: it had to be achieved bodily and in this life.

Fyodorov's cosmism emerged in a specific intellectual context in Russia, at a time when French spiritualism and reincarnation philosophers were markedly popular in Russia and widely read. From here, we can trace Russian cosmism to its roots in Fourier and Flammarion.

Nikolai Berdyaev, a major philosopher and critic in early twentieth-century Russia, reviewed Fyodorov's *Common Task* in 1915. An erudite himself, he recognized Fyodorov's debt to eighteenth-century utopians, and to "Fourier especially."³²⁶ Fourier's idea of the planetary soul, as well as his emphasis on a sort of "common task" in his own writing for humanity to achieve so that reincarnated generations may enjoy it, bears close resemblance to Fyodorov's ideas. Fourier's concept of outer space, however, was still quite basic and lacked the cosmic emphasis of Flammarion and Fyodorov, who focused on reincarnation and resurrection on other planets, not in the distant future of Earth.

Russian intellectuals were well aware of the French reincarnation philosophers, and were particularly interested in them in the 1870s: Jean Reynaud is referenced in the *Russian Encyclopedic*

324 Fedorov, *What Was Man Created For? The Philosophy of the Common Task*, 134.

325 Nikolai Berdyaev, "The Religion of Resuscitative Resurrection: The Philosophy of the Common Task," trans. S. Janos, *Russkaya Mysl'*, no. 186 (July 1915): 76–120.

326 Berdyaev.

Dictionary of 1875, including a mention of *Terre et ciel*.³²⁷ Meanwhile, Flammarion's *La pluralite* was translated into Russian and published in St. Petersburg in 1865; a new translation followed by 1908. The 1870s, however, were a peak time for Flammarion in Russia: 1875 and 1876 saw the publication of two of his major works on astronomical mythology and extraterrestrial life, respectively his *History of Heaven* and *The Inhabitants of Other Worlds*.³²⁸

Spiritualism had been present in Russia since the 1850s. One of the most energetic and dedicated spiritualists in Europe was the Russian Alexander Aksakov, who regularly communicated with his Western and Russian peers, including the preeminent American medium D.D. Home and the founder of Theosophy, Helena Blavatsky; such was his importance to the movement in Russia that he was nicknamed by Dmitri Mendeleev the "apostle of spiritualism."³²⁹ He spent much of his time on spreading spiritualist publications to Russia, including translating several of Swedenborg's works into Russian in the late 1860s. By the 1870s, however, he had become, similarly to Figuiet and others, a sort of "scientific" spiritualist, less interested in its world-changing societal implications and instead focused on achieving empirical legitimacy using scientific methods and arguments. In Russia he faced an uphill battle: spiritualism was decidedly unpopular, and its proponents made into caricatures and the butt of jokes at best, and at worst considered intellectually infantile and dangerously superstitious.

In the year 1875 French spiritualism became a major topic of discussion in Russia. In April the influential zoologist Nikolai Wagner published a letter offering lavish praise for spiritualist ideas and practices he experienced with a French medium the year prior.³³⁰ Dmitri Mendeleev, one of the most famous scientists of the nineteenth century, took umbrage at this flagrant disrespect for modern

327 "Reynaud, Jean," in *Entsiklopedicheskii Slovar'* (St. Petersburg: Brokhaus-Efron, 1875), 499.

328 Camille Flammarion, *Istoriya Neba*, trans. M. Lobach-Zhuchenko (St. Petersburg: A. Tranchel, 1875); Camille Flammarion, *Zhiteli nebesnikh mirov* (St. Petersburg: A. Tranchel, 1876); Camille Flammarion, *Mnogochislennost' Obitayemykh Mirov*, trans. W. Gotwald (Moscow: I.D. Sytin, 1908).

329 Ilya Vinitsky, "Table Talks: The Spiritualist Controversy of the 1870s and Dostoevsky," *The Russian Review* 67, no. 1 (January 10, 2008): 92, <https://doi.org/10.1111/j.1467-9434.2007.00476.x>.

330 Vinitsky, 88.

empirical science. In the ersatz-scientific mode of their philosophy, the two main proponents of spiritualism agreed to bring in experts – among whom were English mediums – to conduct experiments in order to decide once and for all the truth of seances and communication with spirits.

This created an overnight sensation in Russia, leading to what one scholar has described as a “spiritualist season” of séances and reactions lasting from 1875-1876.³³¹ One particularly notable séance took place in Aksakov’s apartment in St. Petersburg, on Friday the 13th of February, 1876. The spiritualists were particularly keen on winning over some of the great literary minds of Russia, among them Dostoyevsky. For Dostoyevsky, although he was fascinated by the idea of seances, spiritualism was “a Western, foreign phenomenon that emerged from materialistic America and threatens to create both a schism in educated Russian society, and—if it should become widespread—sectarian unrest among the people.”³³² Dostoyevsky, along with the other literati present, agreed that the source of spiritual phenomena could not be entirely explained, and that spiritualism was more a matter of faith than fact: such experimental seances would not change anyone’s mind.³³³ This was how spiritualist ideas in the late nineteenth century won intellectual adherents: by displaying easily and widely – if imperfectly – recorded phenomena for which contemporary science had no explanation, believers in reincarnation and spiritual communication could claim that their philosophy offered an answer that future science would be able to absolutely verify.

This séance was not the only encounter Dostoyevsky had in 1876 with new and intriguing philosophical ideas. In March of that year, Fyodorov’s friend and editor Nikolai Pavlovich Peterson sent Dostoyevsky a letter about Fyodorov’s cosmist philosophy, and the great writer was immediately fascinated. In a letter to Peterson he requested personal details about Fyodorov to know him better and perhaps contact him, writing,

331 Vinitsky, 91.

332 Vinitsky, 99.

333 Vinitsky, 101.

[I]n essence I completely agree with his ideas. I read them as if they were my own... In the account of your thinker's ideas, undoubtedly the most essential is the duty of resurrecting former ancestors... An answer is needed to this question [of the nature of Fyodorov's resurrection] – otherwise, everything becomes incomprehensible. I must forewarn you that we here – that is, at least [philosopher Vladimir] Solov'ev and I – believe in a real, literal, personal resurrection and that it will happen on earth.³³⁴

French spiritualism failed to grasp Dostoyevsky; cosmism struck him like lightning. Whereas the table-rappers introduced real or imagined devils into Russian society, Fyodorov's philosophy was on its surface a natively Russian idea, built upon Orthodox Christian principles, that sought instead to unite humanity and end injustice through bodily resurrection in outer space. Russian cosmism, building upon the ideologies of Fourier, Reynaud, and Flammarion, was attractive for the beautiful future it imagined for humankind. Like these French philosophers, Fyodorov made life in outer space core to his utopian vision, offering it was a more scientific approach than the old ways of traditional spiritualists like Kardec and Aksakov.

The influence of cosmism – or extraterrestrial philosophy generally – on Dostoyevsky's literature can be seen through what may be a response to it in the form of one of his last but most famous works: *The Dream of a Ridiculous Man*. In this story, published in 1877, the protagonist is going through a fit of abysmal depression, and his thinking throughout the story is decidedly cosmic, interplanetary: he asks himself, as he is considering suicide at his desk,

At one point, I wondered how it would be if, after living on the moon or Mars and committing some horribly shameful deed there that dishonored and disgraced me in a way that can be imagined only in a nightmare—if, after that, I were transported to earth and remained conscious of what I'd done on the other planet—to which I'd never return; would it then be *all the same* to me as I gazed at the moon from the earth? Or wouldn't I?³³⁵

We can consider this passage in the light of the interplanetary resurrection ideas that stem from Swedenborg: as we have seen, typically core to these ideas is that, while bodily reincarnations have no

334 Quoted in Fedorov, *What Was Man Created For? The Philosophy of the Common Task*, 227–29.

335 Fedor Dostoyevsky, "The Dream of a Ridiculous Man," in *Notes From Underground; White Nights; The Dream of a Ridiculous Man; and Selections from The House of the Dead*, trans. Andrew MacAndrew (New York: New American Library, 1961), 202.

memory of their past lives save during sleep, the ascended spiritual human that resides in outer space or on other planets does remember everything. The protagonist's dilemma, then, is a philosophical rejoinder to French reincarnation theories: if, in the mode of Figuiet, a criminal reincarnates and then, after a noble life, goes on to incarnate further as a spirit traveling through the cosmos, would they regret their criminal actions? Could they feel just in having taken on this more perfect spiritual human form despite the real physical harm their misdeeds on their home planet had done to other human lives?

Dostoyevsky also here contemplates spiritual visitations during sleep, the kind of anti-spiritualist spiritualist belief we see in Figuiet and others. His protagonist relates having met his dead brother in dreams, still fully aware in the dream-state that his brother was long gone from the mortal world but having present-day conversations with him nonetheless.³³⁶

His dream that follows narrates his own death, in which he, from the perspective of his corpse, is still somehow spiritually aware of his being carried off in a coffin and buried. He stays like this, cold and wet, for a while, until he calls out to God. Then, after, he finds himself transported into outer space, moving at an incredible speed and with some "dark, mysterious creature" with some human resemblance carrying him far, far from the planet earth.³³⁷ In the distance of space he sees a star, and he realizes: "Ah, so there is life beyond the grave!"³³⁸

Though he consciously knows that "there were stars in the celestial spaces whose rays took millions of years to travel to the earth" – Dostoyevsky is clearly well aware of contemporary astronomical theories – the protagonist travels even farther beyond, the familiar constellations left behind, until he sees a solar system: one that was not *our* sun, but one exactly like the one that "gave birth to *our* earth."³³⁹ He then catches sight of a facsimile of earth, too, a "little star twinkling with an

336 Dostoyevsky, 203.

337 Dostoyevsky, 205.

338 Dostoyevsky, 205.

339 Dostoyevsky, 206.

emerald light in the darkness,” which causes him rapturous delight and nostalgia, making him feel alive again.³⁴⁰

This second Earth is a remarkable copy of the original: it has a Europe, and indeed a Greece where the protagonist alights on his cosmic journey. On seeing such familiar sights in a place that is not his home he cries out, “I don’t want any other earth. I won’t consent to live on any other planet!”³⁴¹ This experience in outer space, much like the overview effect on astronauts of the present day, only makes him love and cherish his home planet more. When he meets the inhabitants of this Earth, they are supremely beautiful: radiant, intelligent, and supremely happy, a vision much like Ellen G. White’s angelic visitors. In such an Edenic state, they simply knew things about nature and the universe around them, without the need for science or empirical experimentation. Though they were mortal, death was a peaceful experience to them and the protagonist suggests they were able to communicate with their dead, and the presence of life after death was obvious to them.³⁴²

The protagonist corrupts these humans from their perfect Eden by introducing to them the concept of lying. This gives rise to cruelty, discord with nature, jealousy, different languages, separate nations, a love of suffering, and finally a conception of science. This last was the worst: it engendered in the people of this Earth a belief that to return to the utopian perfection of their past was ridiculous, unable even to imagine it. They came to embody what Fyodorov would consider unbrotherly love, a fixation on the self; their conceptions of utopia were founded on individuality, imagining that “each individual, while continuing to love himself everyone else, would at the same time abstain from interfering with others.”³⁴³ The result was suffering.

340 Dostoyevsky, 206 This is perhaps the most cosmic passage in the story: a consideration of what Earth may look like to an extraterrestrial observer. He is incorrect on the colour, though: photographs of Earth from space have revealed our planet to be, in the famous words of Carl Sagan, not green but a “pale blue dot.”

341 Dostoyevsky, 207.

342 Dostoyevsky, 210.

343 Dostoyevsky, 214.

Having been through the exact scenario he feared before his dream – of committing an unspeakable crime on another planet – he realizes that “men can be happy and beautiful without losing the ability to live on earth,” and that we can create a paradise if only we find a way to follow the golden rule of loving our neighbours as we love ourselves.³⁴⁴ In the context of cosmism and spiritualist ideas, Dostoyevsky means here that the promised future paradise should not come after death, but in this life, and perhaps given to all through bodily resurrection. It may be so that it will require a journey to outer space for all people to realize this truth. He concludes with his own common task: “And if everyone wanted it, everything could be arranged immediately.”³⁴⁵

Without direct references, however, we may not know exactly how much the very space-focused philosophy of Fyodorov and particularly Flammarion influenced Russian thought at this time. Certainly, writers like Dostoyevsky were aware of contemporary utopian visions of outer space. The chief enigma remains the 1875-1876 translation of those two mystical-astronomical texts by Flammarion, by the same translator and at the exact time of the rise in interest in Russia of spiritualist beliefs and practices. Was this a coincidence? These were not new works by Flammarion, but had been published in France years before; it may just be that Fyodorov and Flammarion indicate a distinctly sharp rise in curiosity about a human destiny in outer space, on other planets.

It was another phenomenon, however, that arrived right after Russia’s spiritualist season and directed worldwide attention to life in space: the canals of Mars.

In the wake of the Mars craze of the 1870s onward, there was a boom of spiritualist works returning, as they had at the beginning of the century, to the realm of outer space, and particularly to Mars. After this gap of some three or four decades, these emerging spiritualist works show remarkable influence from their French peers, as well as epistemological parallels to the shifts going on in the field of the plurality of worlds. Those writers, some of whom were among the most widely-read of the

344 Dostoyevsky, 216–17.

345 Dostoyevsky, 217.

nineteenth century, emphasized the role of outer space and other planets in reincarnation theories while relying on scientific arguments rather than appeals to religious feeling. Here we will look at Camille Flammarion, George du Maurier, Theodore Flournoy, and Louis Pope Gratacap.

In 1889 Camille Flammarion published *Uranie*, spiritualistic science-fiction novel in three parts that shows a clear evolution of his beliefs from his earlier astronomical and spiritualist works. Like other stories of its kind, it is half-fiction, half-autobiography: Flammarion begins with the tale of Urania, one of the nine Muses of Greek myth, who appears to Flammarion when he is a teenager doing humdrum work with Le Verrier at the Paris Observatory. She takes him on a spiritual adventure into space, much as Swedenborg and the Ridiculous Man had before him, and visits a far-off solar system where he is told about the incredible flora and fauna that live beyond Earth. What follows is a dialogue between the author and Urania, arguing for the plurality of worlds. At the same time, Urania tells Flammarion that humans in the future will abandon their physical forms for more perfect spiritual ones, but this can only be achieved if all the people of Earth are enlightened by astronomical knowledge and learn of this beautiful, immaterial destiny.

Flammarion also learns that life does not exist on all worlds but travels through each in turn for eternity, and that the ending of life on one world is nothing to mourn: “the Earth will come to an end, and some day will be nothing but a tomb. But there will be new suns and new earths, new springs and new smiles, and life will always bloom afresh in the limitless and endless universe.”³⁴⁶

After this, he relates the story of his friend – real or fictional – George Spero, and his lover Iclea. One day George and Iclea were in a hot-air balloon, enjoying the sights of the celestial scenery above, when their balloon malfunctioned and the two were tragically killed. Twenty years later, as he tells it, he was at a séance when his conversation with the medium turned to the planet Mars. The medium described to him a spiritual vision of the planet with its red plants, sandy beaches, and a

³⁴⁶ Camille Flammarion, *Urania*, trans. Augusta Rice Stetson (Boston: Estes and Lauriat, 1890), 62, <https://www.gutenberg.org/cache/epub/41941/pg41941-images.html>.

roaring ocean. Then, Flammarion received a shock: the medium could see his friends there on Mars. In their Martian lives George and Iclea had swapped genders and were still lovers, and were also still thinking about Flammarion. This is unexpected to the astronomer, but he comes to accept it: “the resurrection of my friend and his adored companion on the world of Mars... so remarkably like this one we inhabit, only older, doubtless more advanced on the road of progress,—may appear to a thinker's eyes the logical and natural continuation of their earthly existence...” and so he realizes that spirits truly are immortal and can find new bodies, and that “celestial space is not impassable.”³⁴⁷

In Flammarion’s spiritualist thinking, reincarnation was no longer non-specific and in outer space generally; it could and perhaps naturally would occur on Mars, Earth’s more advanced celestial twin. This brings to mind Proctor’s later ideas, of the succession of life in the planets outward from the life-giving Sun, placing physical life’s next germination on Mars as well, with Jupiter and the outer planets – as Flammarion agrees in *Urania* – currently forming into planets still, preparing to host life of their own. It was Figuiet, too, who supposed that it was the Sun that germinated life through our solar system. In the wake of the Mars craze of the late nineteenth century, pre-existing spiritualist and astronomical beliefs were re-centered on what was then the most plausible abode of life beyond Earth.

Like his contemporaries, Flammarion also moves beyond the basic idea of communication with the dead, separating from earlier spiritualists. With *Urania* he now proposes full telepathy, an extra-sensory perception quite like that described by Toynbee, which can be used by living humans on Earth to perceive what is happening elsewhere on the planet. In one anecdote he uses to prove this, Flammarion cites an alleged tale from the life of Swedenborg, in which the great mystic landed at Gothenburg in western Sweden, and predicted a fire – and its extinguishing – correctly, even though that fire was in Stockholm much too far away from him to have heard word of it already.³⁴⁸ Flammarion uses several such stories to argue for telepathy, though it is curious how he decides to deduce truth

³⁴⁷ Flammarion, 156–57.

³⁴⁸ Flammarion, 194.

here: despite advocating the Baconian method of empirical scientific thinking, Flammarion is ultimately describing anecdotal phenomena and ascribing external meaning to them. Like other spiritualists, his scientific analysis fails in that it does not find a material cause for an observed effect; perhaps, with such an immaterialist philosophical perspective, this was the point.

In Flammarion's, Dostoyevsky's, and Fyodorov's philosophy by the end of the nineteenth century, Earth was a young planet, and foolish: the goal of humanity, then, was to transcend Earth – spiritually or physically – and realize the pettiness of national boundaries, becoming a unified human race and so achieving utopia.

The impact of Flammarion's novel in resurrecting human spirits on Mars was profound and widespread, becoming perhaps his single most influential idea. Following on from Flammarion, Mars for a time became a hot-spot of spiritual activity, both in the writings of dedicated occultists and in more mainstream works of fiction.

One unique example of this is in George du Maurier's *The Martian*. Du Maurier was a French-British cartoonist for the satire magazine *Punch* best known for his highly popular 1894 novel *Trilby*. *The Martian* was his final work, published posthumously in 1896. It describes the social life of a young man, Barty Josselin, who grows up in Paris in the 1850s and, after graduating from school, finds his vision failing which leads to a deep depression and an attempt at suicide; these fictional scenes all retell events in du Maurier's own life. The core story, too, of a French writer who finds sudden success and moves to England is wholly autobiographical.

Josselin is saved by the appearance in a dream of a spirit named Martia, who has come from Mars to guide him. She acts as a sort of guardian angel, advising Josselin and inspiring him; with her aid he becomes a successful writer, and finds the love of his life. The precise way she is described, however, is most revealing of all: she is a disembodied spirit, who possesses Josselin in his sleep and uses his hands to write letters to him that he finds upon waking. The spirit controlling the medium to

send a message bears a close resemblance to spiritualist practice, especially with the advent of spirit-writing devices like Ouija boards.

Martia, in a farewell letter to Josselin, explains that she has too long been disembodied and must reincarnate: she will arrive in the body of Josselin's child, who he is to name Marty, and Martia wonders if she will be reborn as a boy – her preference – or a girl. Up to this point, the role of Mars is a distant one, detached from the real world – until Martia reveals to Josselin:

*You wore the shape once, and so did your father and mother, for you were Martians. Leah [Barty's wife] was a Martian, and wore it too; there are many of them here—they are the best on earth, the very salt thereof.*³⁴⁹

The relationship between herself and Josselin, Martia explains, is the beginning of a new stage of humanity: from this point on humans will begin to understand their place in the universe and become united by a single goal, and will evolve far past their present state: humanity will have dominion over time and space, but by then the Martians will have passed away: “there will be no more Martians in Mars by that time; they are near the end of their lease; all good Martians will have gone to Venus, let us hope; if not, to the Sun itself!”³⁵⁰

This is a distillation of the commonly-accepted ideas about Mars at the time. It contains the idea of Lowell and Flammarion that Mars, like Earth someday, is an old and dying planet, the explanation for why Martians are so advanced and transcendent. The idea of Figuier, that noble souls reincarnate in more spiritual forms and gradually return to the Sun, is present here as well. It is clear most of all that Flammarion's concept of reincarnating Martians caught on, and that a popular novelist like du Maurier could make use of all these Martian ideas in mainstream literature as the reading public was familiar with them. Perhaps, in his autobiographical finale, du Maurier was revealing that he, too, believed in Flammarion's dream of Mars, and like Josselin was saved by a vision of spirit from another planet.

349 George du Maurier, *The Martian* (New York and London: Harper & Brothers, 1897), 402.

350 du Maurier, 406.

The next book, by the Swiss psychologist Theodore Flournoy, is explicitly about spiritualism, and shows an evolution of spiritualist belief in the era of the Mars craze. In 1900 he published the results of his work with an exceptionally gifted medium, whom he calls Mlle. Helene Smith. Beginning in 1894 he studied her various stories of spiritual journeying, which take her, as the book's title introduces, *From India to the Planet Mars*.³⁵¹ As with Lowell, we see here again an overlap between Western Orientalism and fascination with a supposedly occult and spiritualistic East, blending with the unknowable potential of far-off Mars. Mlle. Smith, at an 1894 séance with the patron of Swiss spiritualism Auguste Lemaitre, experienced her first jaunt to Mars. Her depiction of society on the red planet is decidedly utopian, featuring

Carriages without horses or wheels, emitting sparks as they glided by; houses with fountains on the roof; a cradle having for curtains an angel made of iron with outstretched wings, etc. What seemed less strange, were people exactly like the inhabitants of our earth, save that both sexes wore the same costume, formed of trousers very ample, and a long blouse, drawn tight about the waist and decorated with various designs.³⁵²

Flournoy was interested in the phenomena of so-called spiritual mediums, and not only the precise material cause of what mediums attributed to spirits, but the psychological inspirations behind their otherworldly experiences. He noted that Mlle. Smith had been in the company of Spiritists known for their discussions, beginning in 1892, of resurrection on other planets, inspired directly by Camille Flammarion.³⁵³ Not only that, but when she began to have her vision, she said to her host, “Lemaître, that which you have so much wished for!”³⁵⁴ Flournoy himself had discussed with Lemaitre the idea of resurrection on other planets one year prior; in other words, his hypothesis is that Mlle. Smith had this experience of transporting her spirit to Mars because the seed of the idea had already been planted by

351 Theodore Flournoy, *From India to the Planet Mars: A Study of a Case of Somnambulism, with Glossolalia*, trans. Daniel B. Vermilye (New York and London: Harper & Brothers, 1900), 139.

352 Flournoy, 146–47.

353 Flournoy, 142.

354 Flournoy, 148.

the popularity of Flammarion and by Lemaitre's discussions about Mars, which was at that time ubiquitous in the popular press.

In his later book, *Spiritism and Psychology*, Flournoy mentions another medium, Mrs. Smead, who in 1895 similarly had visions of Mars and, just like Mlle. Smith, created a Martian language during her spiritualistic experiences. The respective Francophone and Anglophone backgrounds of Smith and Smead gave rise to wholly different languages: Mlle. Smith's Martian is almost identical to French, with the same grammar but different words and substitute letters.³⁵⁵ Meanwhile, Mrs. Smead produced a language resembling German but written with pseudo-Egyptian hieroglyphics.³⁵⁶

Mrs. Smead, coincidentally, had her first vision of Mars shortly after Lowell published a very widely-read article in the *Atlantic Monthly* about the canals of Mars; Flournoy says that, though neither woman admits to having read popular literature about Mars before their seances, "one must at least acknowledge that such coincidences are very singular."³⁵⁷

He came to the conclusion that the phenomena experienced by spiritualists was real and physical, and represented an aspect of the human organism not yet understood by science but nonetheless not the work of spirits. These phenomena – telepathy, clairvoyance, extra-sensory perception, etc. – are produced by the body, but spiritualism has arisen as an explanation because it offers an emotional catharsis: this information transmitted through the medium comes from the spirits of the dead, giving the living another chance to communicate with their lost loved ones, stripping away the painful finality of death.³⁵⁸ It achieved popular appeal not only through this, but also by continuing the age-old Christian tradition of demonic possession in a more creative, playful, and morally

355 As Flournoy dryly notes, "Happily the Martian, in spite of its strange appearance and the fifty millions of leagues which separate us from the red planet, is in reality so near neighbor to French that there is scarcely any difficulty in this case." Flournoy, 208–10.

356 James H. Hyslop, "The Smead Case," *Proceedings of the American Society for Psychological Research* XII (1918): 64–71. James Hyslop was familiar with the case of Mlle. Smith, and the Smead case was so interesting to American researchers of psychic phenomena that they dedicated a full volume of their journal to it.

357 Theodore Flournoy, *Spiritism and Psychology*, trans. Hereward Carrington (New York and London: Harper & Brothers, 1911), 138.

358 Flournoy, 328–29.

acceptable fashion. By attaching itself to contemporary ideas like Mars, it continues to stay relevant even in the face of scientific challenges like those of Flournoy. At the same time, the cases of Mlle. Smith and Mrs. Smead offer clear evidence not only of how ordinary people understood Mars in their contemporary context, but also how bound up the planet and outer space generally were with spiritualism in the public imagination.

Flournoy did not believe that mediums were making everything up, and asserted that there was something within human beings that explained their experiences, be it forces within the body like organic electricity, or “cosmic memory.”³⁵⁹ He also accepted the concept of immortality and resurrection, but again in a much more scientific kind of way: “in the indestructible atoms of which you are constituted, and which will re-enter into the eternal circulation of life by the indefinite repercussion of our least acts on our material and social environment...”³⁶⁰ This is, more or less, the same atomic approach to resurrection and extra-sensory perception as given by Tsiolkovsky and Toynbee alike.

Not all involved with spiritualism were vague about the sources of their ideas. One in particular, the science-fiction writer Louis Pope Gratacap, was more than eager to explain in directly-quoted detail where his Mars spirituality originated. Though he was American, his writings show direct influence above all from the French spiritualists and their theories of cosmic reincarnation. The result is *The Certainty of a Future Life in Mars* – the title already gets right to the point – essentially half-fiction, half-manifesto much like Flammarion’s *Urania*, published in 1903.

On the face of it, this story is about the journey to Mars of one Bradford Torrey Dodd, who in the framing of the story is pretended to be the actual author and Gratacap the posthumous editor of his writings. Dodd’s father is grieved by the loss of his wife, and he turns his depression into scientific investigation, searching for some way to communicate with his wife’s spirit through “electricity and

359 Flournoy, 30.
360 Flournoy, 330.

magnetism.”³⁶¹ Dodd receives from his father an explanation regarding what happens to spirits after death: a direct, long-form quotation from chapter 13 of Louis Figuier’s *The Day After Death*. Gratacap must have copied from the exact same translation as cited above in the section on Figuier, because it is word-for-word identical, and takes up one and a half pages. The passage Gratacap uses highlights Figuier’s belief that spirits migrate to the Sun, and that rays of sunlight are souls returning to germinate the Earth with life.

Gratacap immediately connects Figuier’s sun-spiritualism with electricity, especially Thomas Edison’s electrification of New York City’s streetlights around 1881.³⁶² Electricity to him offers the potentiality of a wireless connection between two points in space: since the Sun exerts influence on Earth’s magnetic field, he reasoned that there must be some way to, in a sense, hitch a ride on the sun’s rays and thereby devise some form of communication with the other planets, imagining we may “actually look upon their scenes and lives and history, and bring to ourselves in verbal pictures a presentation of their marvellous properties.”³⁶³ Gratacap is referring here mainly to conversation, but he perhaps deliberately obscures visual seeing and verbal hearing.

Much as Gratacap references Figuier, he also notes that he received occult ideas of reincarnation from Helena Blavatsky and her Theosophists, but modified them: he does not believe that reincarnation occurs on this planet, but that it occurs successively in outer space on different worlds.³⁶⁴ He draws his fascination with Mars from Schiaparelli specifically, understanding Mars through a quote of William Herschel, that it is Earth’s natural twin, a close analogy of our own world. Each planet has its own theme, or epoch: Mercury is “brawn,” Venus is “sense,” Earth is “science” and Mars is “spirit.”³⁶⁵ Gratacap is keen to separate this understanding of reincarnation and spirit from spiritualism proper,

361 Louis Pope Gratacap, *The Certainty of a Future Life in Mars, Being the Posthumous Papers of Bradford Torrey Dodd* (New York: Brentano’s, 1903), 13.

362 Gratacap, 20.

363 Gratacap, 23–24.

364 Gratacap, 27.

365 Gratacap, 35–36.

however, which he views as humiliating and “fruitless idiocy” and, implicitly, not scientific.³⁶⁶ Like Lowell, Figuiet, Dostoyevsky, and others, we see too in Gratacap a retention of spiritualist ideas – resurrection and transit to other planets – in the same breath as affirmations of the scientific validity of these same beliefs, detached from spiritualist practice. What began in mysticism has become, gradually, ever more scientific and technological: if we communicate with Mars, it is not because of the visitation of spirits but because of magnetic currents connecting our consciousnesses.

Dodd, with his father, receives an indecipherable Morse code signal from outer space, which he assumes to be a direct communication in the Martian language. Just like Mlle. Smith and Mrs. Smead, Gratacap too is interested in reconstructing how Martians speak, detached as they are by this point in the history of Mars speculation from pure spirit-communication. Gratacap makes no mention of either, but it is possible that he as well as the two mediums were inspired to imagine Martian languages after hearing about the new auxiliary constructed languages of the time, Volapuk and Esperanto.

After Dodd’s father falls ill and dies, Dodd works to find some way that he can receive messages from human spirits on Mars. He succeeds, of course, and in a parallel to the ghostly table-rapping of the derided spiritualists, witnesses the tapping of his Morse code machine set to intercept magnetic messages from space. Dodd’s father, now reincarnated on Mars, where at first he arrived as an immaterial spirit before being reconstituted into flesh and blood: this resurrection is truly physical, a recombination of a separate-but-equal body and soul, the latter being not ghostly, but rather a scientific “psychic fluid” that condenses like water vapour into liquid upon reaching Mars.³⁶⁷

Martian society in Gratacap’s telling is beautiful, full of art and music, with columnar architecture, no distinct nationalities, a “great socialistic republic” centred on a massive metropolis, the City of Light.³⁶⁸ Martians eat only fruit, have no mechanical methods of travel, walking everywhere,

366 Gratacap, 17.

367 Gratacap, 80–81.

368 Gratacap, 89.

and in their physical appearance are fair, white, and young.³⁶⁹ Mars is also, in a sense, a colonized planet: Dodd describes “natural” and “supernatural” inhabitants, the latter being spirits mostly from Earth, and the former being the non-spirit indigenous peoples of Mars, now described as “prehistorics.”³⁷⁰ They are physically smaller and stronger, still eat meat, and are used for labour by the spiritual Martians. It is the reincarnated white spirits who established civilization on the planet and created the universal Martian pastime of music, in a sort of interplanetary retelling of American settler myths. Dodd’s Martians are also supernatural in other ways: they evaporate food they eat instead of defecating, they eventually die of old age, and though they can feel love, sex and childbearing do not exist. Literature and painting do not exist nearly to the same extent as they do on Earth, but astronomy is considered the noblest profession on Mars, in something of an echo of Flammarion’s belief in astronomy uplifting humanity. Finally, worship of God does exist, in dedicated temples, but only through music. In other words, all of this is sort of a material heaven, in which aspects of heavenly life and earthly life are hand-picked by the author to include in the more perfectly ideal Martian society.

Dodd gives a justification for the belief in a future interplanetary life that aligns with Flournoy’s assessment, that belief in reincarnation and communication with the dead was founded on a desire for catharsis, out of loving grief:

We stand on earth speechless before the unseen power which snatches from our caresses all that we most cherish, all that makes our life there worth living. There is no solution of the mystery, no voice, no return, no message, only a blankness of doubt, misgiving and desperate yearning in those who must continue.³⁷¹

In the end Dodd dies, welcoming his own death, his father looking forward to it with happiness even as Mars is struck by comets that destroy some cities. So ends an inventive story that centres its plot on the twin ideas of reincarnation on Mars and interplanetary communication with the dead. These

369 Gratacap, 96 Gratacap probably means whiteness in the literal sense, but the racial undertone certainly is there as well: these superior, transcendent Martians are decidedly light-skinned, with European artistic and architectural aesthetics.

370 Gratacap, 98–99.

371 Gratacap, 138–39.

ideas certainly came not only by way of Figuiet, but Flammarion: Gratacap makes a brief reference to Flammarion's *La Planete Mars* in his direct reprinting of Schiaparelli's *The Planet Mars*, and it bears enough thematic similarity to *Urania* that he may well have read that also.

This is only a handful of works from the latter half of the nineteenth century that discuss Mars, interplanetary communication, and spiritualist ideas. Others include the Venusian feminist utopia of French writer Achille Eyraud, the American physician Gustavus Pope's telepathic spiritist Martians, and the British playwright Richard Ganthony's popular *A Message From Mars* which was adapted into both a novel and the first British science fiction film.³⁷² In comparison, H.G. Wells' *War of the Worlds* stands as something of an outlier with its narrative of violent Martians physically visiting Earth, but it represents a parallel materialist development in thought about outer space and Mars, just as spiritualist ideas were themselves being transformed from mystical phenomena into scientifically-measurable concepts.

So far, we have discussed how spiritualism developed over the course of the nineteenth century, uniting the ideas of reincarnation after death and communication with the dead along with popular perceptions of outer space, particularly Mars. These ideas, which originally had little or nothing to do with Mars or even outer space, became eventually intertwined with the red planet into familiar tropes that authors could expect their readers to understand. These ideas also combined with the popular taste for future utopias, transplanting these images from the coming centuries here on Earth onto contemporary Mars as an image of what our planet and society may become in the future. One question

372 Achille Eyraud, *Voyage a Venus* (Paris: Michel Levy Freres, Libraires Editeurs, 1865); Gustavus W. Pope, *Journey to Mars. The Wonderful World: Its Beauty and Splendor; Its Mighty Races and Kingdoms; Its Final Doom*. (New York: G.W. Dillingham, Publisher, 1894); Richard Ganthony, *A Message from Mars: A Fantastic Comedy in Three Acts* (New York: Samuel French, 1923); Lester Lurgan, *A Message from Mars: A Story Founded on the Popular Play by Richard Ganthony* (London: Greening and Co., 1912); *Mr Charles Hawtrey in a Cinematograph Version of a Message from Mars* (The United Kingdom Films, 1912) "A Message from Mars" is, essentially, an adaptation of Charles Dickens' more enduringly popular "A Christmas Carol" but for the age of the Mars craze.

remains: the exact link between this spiritualistic concept of outer space and the early rocket pioneers, who turned interplanetary imaginings into a physically possible reality.

Chapter 3: Ghost in the Rocket Machine

Spaceflight was nothing new to European and American writers by the close of the nineteenth century. Early modern writers like Cyrano de Bergerac and Francis Godwin had imagined semi-technological or fantastical methods of traveling into outer space, but these largely came before the revelation of the vast distances between celestial bodies and the nature of the vacuum of space: there was less writing about spaceflight when it became clear that one could not simply ride a chariot of birds to the Moon. Some, like William Leitch in the 1860s, hypothesized correctly that Newton's laws of motion allowed reactive motion (rockets) to function in outer space; the broad scientific consensus, however, believed that rockets required an atmosphere to push against to propel themselves and thus would be useless in outer space.³⁷³ By and large, nineteenth-century writers wishing to set a story in outer space did not give much thought to rockets, instead imagining fantastical travel methods as anti-gravity, spiritual teleportation, and even comets.

Perhaps the most famous example of nineteenth-century space travel comes from Jules Verne, with his *From the Earth to the Moon*, published a few years after Flammarion's first major work on life on other worlds, in 1865. While not as eminently popular as his *20,000 Leagues Under the Sea* or *Journey to the Center of the Earth*, this book nonetheless carries one remarkable expression: "we shall one day travel to the moon, the planets, and the stars, with the same facility, rapidity, and, certainty as we now make the voyage from Liverpool to New York!"³⁷⁴ Verne's story is, otherwise, remarkably non-spiritual: there are no people to be found on the Moon, and it is purely a scientific adventure excepting the now-known fact that people could not travel to outer space via being shot through a gun. It was enough of a touchstone, however, that when Robert Goddard published in late 1919 his plan to make a

373 "A Severe Strain on Credulity," *New York Times*, January 13, 1920, sec. Topics of the Times; Frank H. Winter, *Rockets Into Space* (Cambridge, Massachusetts: Harvard University Press, 1990), 28.

374 Jules Verne, *From the Earth to the Moon; and Round the Moon*, trans. Louis Mercer and Eleanor E. King (New York: Scribner, Armstrong & Company, 1874), 93.

rocket that could reach outer space, newspapers immediately made the connection between Goddard's moon rocket and Verne's moon gun.³⁷⁵

Previous accounts of the history of spaceflight have, contrary to the narrative given here, attributed the quest for interplanetary journeys to a human impulse to explore, overcome boundaries, or resolve scientific curiosities. As a result, these histories have leaned heavily on the more scientifically-sound – by modern standards – science fiction of Verne as the crucial stepping stone toward the realization of this goal.³⁷⁶ This not only ignores the influence of spiritualism and extraterrestrial life theories in inspiring people to think about outer space in the nineteenth century, it also draws too deterministic a teleological line, looking backward from a present in which rockets have carried people to the Moon and seeing it all as necessary cause and effect: because, in the words of NASA historian Homer Newell, the lineage from early Chinese and Mongol war rockets to “the immensely larger rockets used as space launch vehicles is unmistakable.”³⁷⁷ This seems doubtful, other than the fact that both operate according to Newton's laws of motion, considering that throughout the nineteenth century massive cannons and pseudo-scientific anti-gravity machines were the main modes authors imagined humans would use to travel to outer space.³⁷⁸

This narrative also hinges on the early rocket scientists themselves being inspired by a modern perception of objective science and not by spiritualistic or occult ideas. This, as has been shown, is problematic due to the fact that the nature of “science” was constantly in flux: defenders of spiritualism, telepathy, extra-sensory perception, extraterrestrial life, reincarnation, and communication

375 “Goddard Rivals Jules Verne in Plan For Sending a Rocket to the Moon,” *Pittsburgh Leader*, June 20, 1920; “Modern Jules Verne Invents Rocket to Reach Moon,” *Boston American*, January 12, 1920; “Dr. Goddard of Worcester to Attempt By Rocket Verne's Famous Trip to the Moon,” *Worcester Telegram*, June 13, 1920 also printed in the *New York Sun*.

376 Homer E. Newell, *Beyond the Atmosphere: Early Years of Space Science*, The NASA History Series (Washington, D.C.: NASA, 1980), 26.

377 Newell, 25.

378 Notably, in his otherwise spiritualist novel, Gratacap makes an explicit reference to a contemporary vehicle imagined to make the journey to Mars, by Hugh MacColl around 1889: those who were interested in Flammarion-style spiritual travel were certainly aware also of physical travel. Gratacap, *The Certainty of a Future Life in Mars*, 70.

with the dead and with other planets all vigorously defended their theories as being scientifically valid. Too much of this writing on the history of spaceflight, then, has been confirming the prescience of early inventors and thinkers in hindsight, rather than understanding them as people of their own intellectual era. The main set of rocket pioneers in the traditional narrative, however – Robert Goddard, Hermann Oberth, Wernher von Braun, and Konstantin Tsiolkovsky – all engaged with occult or spiritualistic ideas, as well as the plurality of worlds debate.

Robert Goddard of Worcester, Massachusetts, was a remarkably shy and secretive man: for this reason, despite becoming the first to launch a liquid-fueled rocket and proving that rockets can operate in the vacuum of space, carried little immediate influence on rocketry in America compared to his contemporaries in Germany and the Soviet Union.³⁷⁹ In his papers, he personally admitted to “being properly conservative and for lacking the courage of those who have published rocket articles of an interplanetary tone since 1920.”³⁸⁰ Like the others he was ostensibly directly inspired by Verne and Wells, but his lesser-known writings he displays a keen interest in the connection of space, extraterrestrial life, and life after death.³⁸¹

In his younger years Goddard was much more outspoken about outer space and life on other worlds, writing for his high school class two articles titled “The Navigation of Space” and “The Habitability of Other Worlds.” Evidently Goddard favoured the idea of life on other worlds, and may have read Flammarion, Proctor, or Lowell: all were extremely popular when he was young.

His diary entries for 1905 note that Goddard in August was reading about reincarnation and theosophy and had his horoscope read the same month.³⁸² The next year in February he noted having

379 J. D. Hunley, “The Enigma of Robert H. Goddard,” *Technology and Culture* 36, no. 2 (1995): 327, <https://doi.org/10.2307/3106375>.

380 Robert H. Goddard, “Material For An Autobiography,” in *The Papers of Robert H. Goddard*, ed. Esther C. Goddard (Worcester, Massachusetts: Clark University Library, 1927), 34.

381 Richard Rhodes, “God Pity a One-Dream Man: The Ordeal of Robert Hutchings Goddard,” *American Heritage* 31, no. 4 (July 1980): paras. 7–8, <https://www.americanheritage.com/god-pity-one-dream-man>.

382 Robert H. Goddard, “The Year 1905,” in *Robert H. Goddard Diary*, ed. Esther C. Goddard (Worcester, Massachusetts: Clark University Library, 1905), 190, [https://database.goddard.microsearch.net/Document?db=GODDARD-UNRESTRICTED&query=\(select+580\)](https://database.goddard.microsearch.net/Document?db=GODDARD-UNRESTRICTED&query=(select+580)).

read the book *The Occult World*, an occult Theosophist text.³⁸³ This is the most explicit reference to spiritualist-adjacent influence in Goddard's papers. The author of this book, Alfred Percy Sinnett, particularly discusses resurrection, and particularly the idea that in the future "new civilization" the dead will be resurrected in a similar sense to Fyodorov's bodily return of life after death.³⁸⁴

Reincarnation seems to have stuck with him most out of all, to the point that in 1925 he would write a brief private letter on "The Doctrine of Recurrence." In this piece, Goddard argued that, since the universe is infinite in time and space, scientifically speaking it makes sense that after enough time the universe will contain the same configurations over and over again, replaying events that already happened in the now-distant past. For Goddard, this meant

This kind of immortality for everyone should lead to very beneficial results upon behavior, as soon as it is realized, for, if our lives are to be reproduced, the more sordid, narrow, and unidealistic they are, the less pleasant will be the prospect of living them over again in the future.³⁸⁵

This statement shows a modernizing reinterpretation of previous theories about reincarnation and future lives. The essence is the same, but the procedure is different. As late as 1918, and perhaps beyond, Goddard also believed that the Earth would eventually become inhospitable for human beings, the same strain of belief that Fourier, Flammarion, and others held strongly in their mystical and interplanetary philosophies. The First World War made him fearful for humanity's future, and so he wrote a manuscript labeled "Special Formulae For Silvering Mirrors" that included ideas on "the last

383 Robert H. Goddard, "The Year 1906," in *Robert H. Goddard Diary*, ed. Esther C. Goddard (Worcester, Massachusetts: Clark University Library, 1906), [https://database.goddard.microsearch.net/Document?db=GODDARD-UNRESTRICTED&query=\(select+602\)](https://database.goddard.microsearch.net/Document?db=GODDARD-UNRESTRICTED&query=(select+602)).

384 A.P. Sinnett, *The Occult World* (London: Trubner & Co, 1883), 102–3 This is an early work of Theosophy, originally published in 1881. It followed the general trend of Theosophical thought in emphasizing past knowledge regained through dedicated study of ancient wisdom, especially Buddhist, Hindu, and classical Hermetic texts. It argued against older spiritualism, and instead believed that what was previously attributed to spirits was a natural and controllable phenomenon within the human body.

385 Robert H. Goddard, "Affidavit, The Doctrine of Recurrence," in *The Papers of Robert H. Goddard*, ed. Esther C. Goddard (Worcester, Massachusetts: Clark University Library, 1925), 575.

migration of the human race” into the depths of space, a journey taking tens or hundreds of thousands of years to reach its destination of, presumably, another habitable world.³⁸⁶

Hermann Oberth, a Romanian-born German who worked on rockets for Nazi Germany, was the only one of the original trio of spaceflight pioneers who lived long enough to see human spaceflight. In an interview near the end of his life in 1987, he also gave his chief inspiration as being Verne’s *From the Earth to the Moon*.³⁸⁷ Like Goddard, however, his lesser-known writings hint at concealed interests and feelings. In 1932, he published *Research and the Afterlife: Where Does the Modern Scientific Soul and Afterlife Research Stand?*³⁸⁸ This appeared in the esoteric occult periodical *Die Weisse Fahne* alongside articles on astrology, spiritualism, and similar pseudo-scientific topics.³⁸⁹ Oberth’s esoteric belief continued into his later life: in an article for the *Cleveland Plain Dealer* in 1954, he asserts that the UFOs that had been reported over the past decade were, in fact, extraterrestrial visitors. He considers them a naturally highly superior civilization, and, perhaps most interesting of all, reveals a belief in parapsychology, particularly telepathy, which he suggests these extraterrestrial beings may use to communicate with humans.³⁹⁰ His belief at the time was that human beings were only just starting the process of sending a spacecraft to another planet in our solar system, and that in light of these visitors, “we should try by every scientific means that seems feasible to get into contact with them.”³⁹¹ Successful contact, he imagined, could advance humanity by one hundred thousand years, and reveal hitherto unknown secrets of the universe. Even a decade later, this was a very niche opinion: a Gallup

386 Goddard, “Material For An Autobiography,” 25.

387 Hermann Oberth, Interview with Hermann Oberth, interview by Martin Harwit and Frank H. Winter, November 14, 1987, 3, https://www.si.edu/media/NASM/NASM-NASM_AudioIt-000006596DOCS-000001.pdf.

388 Birgit Menzel, Michael Hagemester, and Bernice Glatzer Rosenthal, eds., *The New Age of Russia: Occult and Esoteric Dimensions*, Studies on Language and Culture in Central and Eastern Europe, v. 17 (München: Otto Sagner, 2012), 145; Hermann Oberth, *Forschung und Jenseits. Wo steht die moderne wissenschaftliche Seelen- und Jenseits-Forschung?*, *Die Weisse Fahne* 74 (Pfullingen: Johannes Baum, 1932).

389 “Weisse Fahne,” The International Association for the Preservation of Spiritualist and Occult Periodicals, accessed January 5, 2023, http://iapsop.com/archive/materials/weisse_fahne/.

390 Hermann Oberth, “Flying Saucers Come From a Distant World,” *Cleveland Plain Dealer*, October 24, 1954, sec. The American Weekly.

391 Oberth.

poll from 1966 asked its 1574 respondents across the United States “Just what do you think these 'flying saucers' are?”³⁹² Only 7% of respondents were of the same mind as Oberth a decade before, certain that they were otherworldly visitors – the same percentage that believed they were simply a figment of the imagination.

Oberth’s contemporary and protege, Wernher von Braun, is well-known for being the head of Nazi Germany’s V2 rocket program as well as NASA’s Apollo missions. He, too, had a fascination with the spiritual and extraterrestrial: in 1949 he wrote a novel titled *Project Mars: A Technical Tale*, a work of science fiction that envisioned human civilization on Mars, “conversing on terms of familiarity with the inhabitants of Mars” and eventually finding a new star to escape a dying Earth.³⁹³ In a more professional capacity, after the success of the July 1969 Moon landing, in August he gave a presentation to NASA’s Space Task Group on their next goal: Mars. His rationale for this more ambitious expedition was to discover life on the red planet, to “resolve this universal question thus capturing international interest and cooperation.”³⁹⁴ His interests also extended to the question of life after death. On this topic he stated,

Science, for instance, tells us that nothing in nature, not even the tiniest particle, can disappear without a trace... Now, if God applies this fundamental principle to the most minute and insignificant parts of His universe, doesn't it make sense to assume that He applies it also to the masterpiece of His creation — the human soul? I think it does. And everything science has taught me — and continues to teach me — strengthens my belief in the continuity of our spiritual existence after death. Nothing disappears without a trace.”³⁹⁵

392 Gallup Organization, “Questions from Gallup Poll # 1966-0727: Vietnam/Politics/UFOs/Safety Standards in Automobiles (Roper #31087708),” Polling Data, Roper iPoll, 1966, <https://ropercenter.cornell.edu/ipoll/study/31087708/questions#21f6cf13-e2ba-44ab-8574-e9e867e94bec>.

393 Wernher Von Braun, *Project Mars: A Technical Tale*, trans. Henry J. White, n.d., 7, 214, <https://archive.org/details/ProjectMars/mode/2up>.

394 Wernher Von Braun, “Manned Mars Landing,” https://www.nasa.gov/sites/default/files/atoms/files/19690804_manned_mars_landing_presentation_to_the_space_task_group_by_dr_wernher_von_braun.pdf.

395 Wernher Von Braun, “Why I Believe in Immortality,” in *The Third Book of Words to Live By* (New York: Simon and Schuster, 1962), 119–20.

This was a popular work, and thus von Braun's beliefs were no secret: this quote would be most famously reprinted as the epigraph to Thomas Pynchon's 1973 postmodernist novel *Gravity's Rainbow*. In this scientific belief in a kind of atomic, thermodynamic form of resurrection and reincarnation, von Braun's ideas closely resemble those of Goddard and his eternal recurrence, but especially those of Russia's Konstantin Tsiolkovsky.

Tsiolkovsky is both the oldest and the most steeped in Flammarion-esque philosophy of the three rocket pioneers. Tsiolkovsky changed Fyodorov's cosmism to his own, more technological and sociological, ends. Unlike Fyodorov, Tsiolkovsky was a much more technical thinker, more ready to discuss the actual material matters of how to get to outer space as opposed to the vague ideas of those who had come before him.

In "The Future of Earth and Mankind," Tsiolkovsky states that the human "future destiny is the destiny of the universe."³⁹⁶ In order to achieve this destiny, several steps must be taken first: in true Cosmist fashion, humanity must unite, and use a multi-million man volunteer army to clear the lands of South and Central America for cultivation, with this property being held in common by all people. This is crucial, because all the potential of Earth and humanity – that is, universal resurrection and space travel – can be unlocked when the human population has increased one thousand times: "reproduce, fill Earth, and dominate nature" is his credo.³⁹⁷ His ultimate desire with all of this, including the resurrection of all those who have died, is to "achieve perfection and banish all possibility of evil and suffering in the solar system."³⁹⁸ This is a far cry from the fairly staid ideas of Verne and even H.G. Wells!

Not all of his works are so technical, however. In his "Theorems of Life," one of several of his pieces on panpsychism or the belief that all things in the universe have consciousness, he explains how

396 Konstantin Tsiolkovsky, "The Future of Earth and Mankind," in *Russian Cosmism*, trans. Thomas Campbell (New York: MIT Press, 2018), 114.

397 Tsiolkovsky, 117.

398 Tsiolkovsky, 131.

he understands all matter to have a spirit, as human beings are supposed to.³⁹⁹ Everything that exists was once a part of everything else at some point in the past, and will be again in some point in the future. Every single atom, therefore, has its own life, even if it is not always able to remember or perceive this:

In inorganic bodies, the atom is like a wanderer who travels sleepily without any impressions in an unvaried, limitless desert similar to a sea. Here it is in a state of nonbeing. When it enters the bodies of animals, it is as if it is vacationing in hotels of the most wide-ranging quality. Here it transitions into being and perceives what animals perceive.⁴⁰⁰

Unlike the spiritualists and Toynbee, who believed in a mind-body duality in which the body and spirit are separate but equal elements that together make up the human being, Tsiolkovsky's philosophy held that our perceived consciousness is simply the conscious atoms that make up our bodies being able to understand and feel physical sensations in a way that makes sense to us. Countless atoms that once made up a part of our bodies will leave us before we experience "death," and even when we die, our atoms will reconstitute in other forms, or wander in nonbeing until they transition again into animal being. This is, in essence, a more scientific evolution of the classic spiritualist belief in reincarnation, even if it is in a form that is far less cathartic to the grieving. He did, however, share the spiritualist idea of immaterial human perfectibility: he imagined that, in the far future, humans would evolve to extreme lengths to become true superhumans, transcending our corporeal forms and our individual consciousnesses to form a kind of radiation, boundless in time and space.⁴⁰¹

This were mainstream, well-known aspects of Tsiolkovsky's philosophies, to say nothing of the general ideas of spaceflight, planetary colonization, and resurrection of the dead; his most truly obscure works add into the equation the question of extraterrestrial intelligence, which Fyodorov did not

399 Konstantin Tsiolkovsky, "Theorems of Life (as an Addendum and Clarification on Monism)," in *Russian Cosmism*, trans. Anastasia Skoybedo (New York: MIT Press, 2018), 157–58.

400 Tsiolkovsky, 164.

401 Bernice Glatzer Rosenthal, *The Occult in Russian and Soviet Culture* (Ithaca and London: Cornell University Press, 1997), 198.

address in his original cosmist writings. In 1933, shortly before his death, he wrote “The Planets are Occupied by Living Beings,” an article mathematically explaining that life in the universe should be very common, and asking the same question that Enrico Fermi would introduce almost two decades later: why have these dwellers on other worlds not contacted us, given so much time and given their logically great number?⁴⁰² Like his American and German counterparts, however, after his death the narrative about his motivations was rewritten to remove what were by then unpalatable associations with the mystical and spiritual: in the official history of the Soviet space program, Tsiolkovsky is motivated by a generic love of science and desire for a better future for humanity, spurred on not by a belief in atomic resurrection but by oppression he faced under the Tsarist state.⁴⁰³

By pure coincidence, James Morasco with his Toynbee tiles reached an identical conclusion as Tsiolkovsky, and tried to export it back to Tsiolkovsky’s homeland. In one letter sent in May 1983 to “The People of The U.S.S.R.,” Morasco writes in an attempt to spread his big idea to the Soviet Union, trying to appeal to the plight of “kulaks” and “zeks” – neither of which were especially great in number by the 1980s.⁴⁰⁴ This letter was headed with his typical message: “Toynbee’s idea in movie ‘2001: A Space Odyssey’ – to bring every dead molecule of every human body of history to life on planet JUPITER.”⁴⁰⁵ Perhaps ideas themselves are also subject to some form of reincarnation.

These rocket pioneers, from Tsiolkovsky to von Braun, were hardly alone in believing in and speculating about reincarnation, resurrection, and life on other worlds. Rather, this was the norm: other thinkers in the field of rocketry and spaceflight at the time, like Max Valier, John Whiteside Parsons, and Hermann Gandswindt, also believed in and wrote on such topics, though these are less well-known

402 B Finney, V Lytkin, and L Finney, “Tsiolkovsky and Extraterrestrial Intelligence,” *Acta Astronautica* 46, no. 10 (June 1, 2000): 745–49, [https://doi.org/10.1016/S0094-5765\(00\)00042-4](https://doi.org/10.1016/S0094-5765(00)00042-4).

403 Evgeny Ivanovich Ryabchikov, *Russians in Space*, ed. Nikolai Kamanin (Garden City, New York: Doubleday, 1971), 94, <http://archive.org/details/russiansinspace00rjab>.

404 Morasco, “Minority Association Documents,” 5 Kulaks were independent farmers who were largely eradicated by the late 1930s, and zeks were gulag inmates whose population dwindled steadily from the 1950s onward.

405 Morasco, 5.

than their more scientifically-sound works that have stood the empirical and cultural test of time.⁴⁰⁶

That these scientists have had a particular, non-esoteric narrative told about their contributions to spaceflight is part of the greater trend seen here to transition from mystical and religious thought to modern, scientific conceptions of the very same ideas, adopted and transmitted into different forms over time. The religious utopianism of Saint-Simon and Fourier became the scientific communism of Marx and Lenin; the spiritual reincarnation of Swedenborg became the consciousness of atoms in Tsiolkovsky; the spiritualist communication with the dead of Kardec and many others became telepathy, extra-sensory perception, and psychology.

The story of spaceflight follows a similar theme: it is in one sense a relic of the nineteenth century, a peculiarity of European belief that death was not the end of life and the Earth was not the only one of God's created worlds. Just as eighteenth-century scientists like Isaac Newton and Swedenborg mixed mysticism, religious faith, and empirical science into a semi-magical, worshipful concoction, their successors by the beginning of the twentieth century had come close to completing the task of stripping away that magic and esoterica into what we consider today as science. Flammarion and his contemporaries imagined that it would be poets and astronomers who would reign in the interplanetary future; in truth, it would be engineers and mathematicians.

406 Menzel, Hagemester, and Rosenthal, *The New Age of Russia*, 145; Rosenthal, *The Occult in Russian and Soviet Culture*, 198.

Conclusion

For one beautiful moment it was finally real. On July 20th, 1969 the sleepers awoke to find their dream had come true: Man had transcended Earth and set foot on another world, with 650 million earthbound spirits remotely viewing this bodily ascension via television. Not even four years later the slumber returned, the great dream receding into soporific memory. We still imagine, someday, it will be real again.

Traditional narratives of the history of human spaceflight have centred on the Space Age, that period from 1957 to 1969 when manned space missions were at the forefront of American and Soviet national priorities: all that came before is washed away as mere dreaming, the prophesying of bygone sages who never lived to see the fulfillment of their literary oracles. In truth, we are still dreaming: to this day we have not become a transcendent and space-faring civilization. Our focus is still here on Earth, and when we venture beyond this planet's gravity it is merely for a brief jaunt, a piece of showmanship between nations, and no more. Writers of the Space Age counted a too-early victory, constructed a new heroic narrative, and in doing so failed to understand the nature of what drew people to the promise of going to space.

In the nineteenth century, ordinary people were fascinated by the wonders of the cosmos and the hope it held. Someday, they thought – in this life or the next – we may meet inhabitants of other worlds, or even become said inhabitants ourselves. The human destiny was inexorably cosmic: to overcome suffering on this Earth and meet our fellow-beings from other stars. These ideas had mystical, Christian roots: people wondered what enabled consciousness, and so imagined that the spirit escapes its bodily form after death and travels the cosmos to visit other planets, becoming a new form of life in a divinely-crafted universe. By the early twentieth century the core tenets of extraterrestrial life, and resurrection in space had become commonplace, but had become natural and scientific: though

empirical science could not prove life on other worlds or after death, people passionately believed in it as a logical deduction from their own terrestrial experience, just as telescopes brought the planets close into view but never close enough to touch.

This spiritual, transcendent understanding of outer space enabled its mass popularity and inspired the founders of rocketry to create vehicles to conquer gravity. This was, perhaps, its downfall: national governments found it too fantastical, and so a new narrative was forged that emphasized a secular and national triumph, a victory of modernity that would open a new age of exploration. In creating a narrative so divorced from the historic roots of popular enthusiasm for space, this new narrative may have crushed what it sought to create.

How could rockets be humanity's salvation at the same time that they bear weapons capable of destroying all life? How could outer space transcend human sins when its greatest proponents were two vast empires locked in conflict? And in an age of racial and gender inequality, how could space programs claim to represent all mankind when their directors and scientists and astronauts were almost exclusively white men? The nineteenth-century public largely pictured a human destiny in outer space only as a result of people on Earth overcoming their differences, ending war, and working together in a common task. In the Space Age two human nations came to the brink of total annihilation, the farthest point imaginable from a unified and cooperative human race. Perhaps above all, this new narrative of spaceflight was centred on the march of modern progress and memories of European exploration, conquest, and colonization. How could it capture universal appeal when it deliberately evoked the destructive excesses of Western modernity and the centuries-long oppression of European imperialism?

In the end, it is an incredible thing that the idea of spaceflight survived its nineteenth-century cradle. Many other key ideas that lived alongside it – social Darwinism, animal magnetism, telepathy, phrenology, vitalism, Lamarckism, the hollow Earth, catastrophism, homeopathy, communication with the dead, and life on other planets in our solar system, the list goes on – have since gone extinct or

faded into pure pseudoscience. Indeed, much of what drove the ultimate idea of spaceflight was on its intellectual back foot throughout the nineteenth century: theories of life on other worlds were steadily being struck down until only Mars remained as a desperate hope for extraterrestrial existence, and spiritualism became increasingly embarrassingly incompatible with modern, serious scientific endeavours.

It was never at any point necessary that spaceflight be achieved, nor that humanity's destiny be intertwined with the greater cosmos beyond our planet: this was something that we made real, a deliberate choice, a dream so singularly inspiring and so strongly held that eventually it became reality. It may yet be that spaceflight is found to be untenable, that we cannot reasonably escape the bounds of our planet en masse and create homes on other worlds as hoped, or that we truly are constrained by the speed of light and any hope of touching worlds beyond our solar system in a human lifetime – and contacting other intelligent beings – are dashed entirely. In this case, spaceflight will be remembered by humans living centuries from now as a peculiar curiosity of the nineteenth through the twenty-first centuries, hardly any different than outdated beliefs in the four humours. Or, we may continue to hope nonetheless that this does not come to pass, and that we can overcome our terrestrial limitations and injustices and journey into the cosmos.

Just as ancient astronomy was born out of a desire to understand the divine motions of the stars and planets and the deities that resided in those heavens above, so too did spaceflight emerge from mystical, religious belief in other habitable worlds and the human spirits who live on them that we may contact. It is wrong to deny this history, strange as may seem to us today: it reminds us that the idea of placing the future of human life on other worlds was not the necessary outcome of technological modernity, but a transcendent belief in the infinite possibility of the universe beyond our Earth.

Perhaps no better were these thoughts expressed than by the eighteenth century poet Edward Young in his *Night Thoughts*, which became one of the most reprinted poems of the nineteenth century:⁴⁰⁷

“How can man’s curious spirit not inquire,
What are the natives of this world sublime,
Of this so foreign, unterrestrial sphere,
Where mortal, untranslated, never stray’d?
‘Whate’er your nature, this is past dispute,
Far other life you live, far other tongue
You talk, far other thought, perhaps, you think,
Than man. How various are the works of God?
But say, what thought? Is Reason here enthroned,
And absolute? or Sense in arms against her?
Is this your final residence? If not,
Change you your scene, translated? or by death?
And if by death; what death?—Know you disease?
Or horrid war?—With war, this fatal hour,
Europa groans (so call we a small field,
Where kings run mad). In our world, Death deposes
Intemperance to do the work of Age;
And hanging up the quiver Nature gave him,
As slow of execution, for despatch
Sends forth imperial butchers; bids them slay
Their sheep (the silly sheep they fleeced before),
And toss him twice ten thousand at a meal.
Sit all your executioners on thrones?
With you, can rage for plunder make a god?
And bloodshed wash out every other stain?—
But you, perhaps, can’t bleed: from matter gross
Your spirits clean, are delicately clad
In fine-spun ether, privileged to soar,
Unloaded, uninfected; how unlike
The lot of man! how few of human race
By their own mud unmurder’d! how we wage
Self-war eternal!—Is your painful day
Of hardy conflict o’er? or, are you still
Raw candidates at school? and have you those
Who disaffect reversions, as with us?—
But what are we? You never heard of man;
Or earth, the bedlam of the universe!”⁴⁰⁸

407 Michael J. Crowe, ed., *The Extraterrestrial Life Debate, Antiquity to 1915* (Notre Dame, Indiana: University of Notre Dame Press, 2008), 199.

408 Edward Young, *Young’s Night Thoughts*, ed. George Gilfillan (Edinburgh: James Nichol, 1853), ll. 1752–1805.

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