

INTRODUCTION

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THE DREAM OF EXPLORING OTHER WORLDS goes back centuries. Despite the remote possibility of reaching even the planets in our solar system, humanity has transplanted itself for millennia to the surfaces of other spheres as explorers, as settlers, and as frontiersmen living at the furthest point of existence in our collective imagination. Humans have explored the Moon since at least the Middle Ages, taking up residence on the shores of its silver lunar seas, easily cohabitating with the friendly but mysterious natives. We've traversed Venus's vast, smoky jungles and paddled the canals of Mars in an alien gondola, like a tourist in Venice headed down the Grand Canal toward Piazza San Marco. Scientific speculation on finding inhabitants on other worlds or the possibility that we will someday reach our neighboring planets is a concept older than even Newton's reflections on gravity. In 1638 Bishop John Wilkins proclaimed in his famous *The Discovery of a World in the Moone* that "a plurality of worlds doth not contradict any principle of reason or faith," and there is, in fact, "a world in the Moone. However, I am not so resolute in this, that I thinke tis necessary there must be one, but my opinion is that tis possible there may be, and tis probable there is another habitable world in that Planet."¹ Wilkins's conviction assured him that someday "its possible for some of our posterity, to find

out a conveyance to this other world, and if there be inhabitants there, to have commerce with them.” The bishop’s matter-of-fact faith in interplanetary travel has, for much of recent history, been a commonplace assumption. It is only a problem of time and discovery, but aside from those trivialities, we believe that, oh yes, we will journey to other planets. The planets have been home to either human explorers or friendly extraterrestrials in our imaginations for so long that the discovery of the lack of life elsewhere is more shocking. After centuries of imagining ourselves moving out across the solar system, like the Pilgrims crossing the ocean for the New World, the idea of leaving Earth for another planet seems practically written into our DNA. We might not know exactly when, and we only have a reasonably good idea of how, but we know down to our bones that someday we will overcome the limits of time and gravity and wash up on an alien shore.

But the decision to go to space is not an intuitive one.

First, there’s the fact that it’s a vacuum. This, of course, means that there’s no air and no atmosphere to deflect dangerous cosmic rays. There’s also the absence of a strong gravitational field that makes objects in motion move with the comforting predictability that they do on Earth, rather than floating aimlessly or hurtling at speed toward the pull of a larger body. And then there’s the problem of the vast distances between objects, distances that humanity has yet to think of a way to collapse into a time scale within the span of a human life—or at least the length of several years. Even reaching Mars—not really our nearest neighbor but rather our most hospitable; technically our nearest neighbor is Venus, but no one seems in a hurry to get there—requires a journey of several months, longer than even transatlantic voyages on steamships of more than a century ago. And none of this considers how the people who got there could get back again.

Strangely, and despite the stubborn fact of Mars’s remoteness, people all over this planet are straining at the leash to go. When a team of researchers at the National Aeronautics and Space Administration (NASA), charged with investigating the possibility of sending human beings to Mars and back, joked that the whole endeavor would be much simpler if it was a one-way trip, their office was metaphorically flooded with emails from people from around the world offering their services as astronauts and explorers—in fact, they were offering their lives. Young people, old people, Americans, and otherwise: tens of thousands of card-carrying earthlings volunteered to become the first Martians, to leave

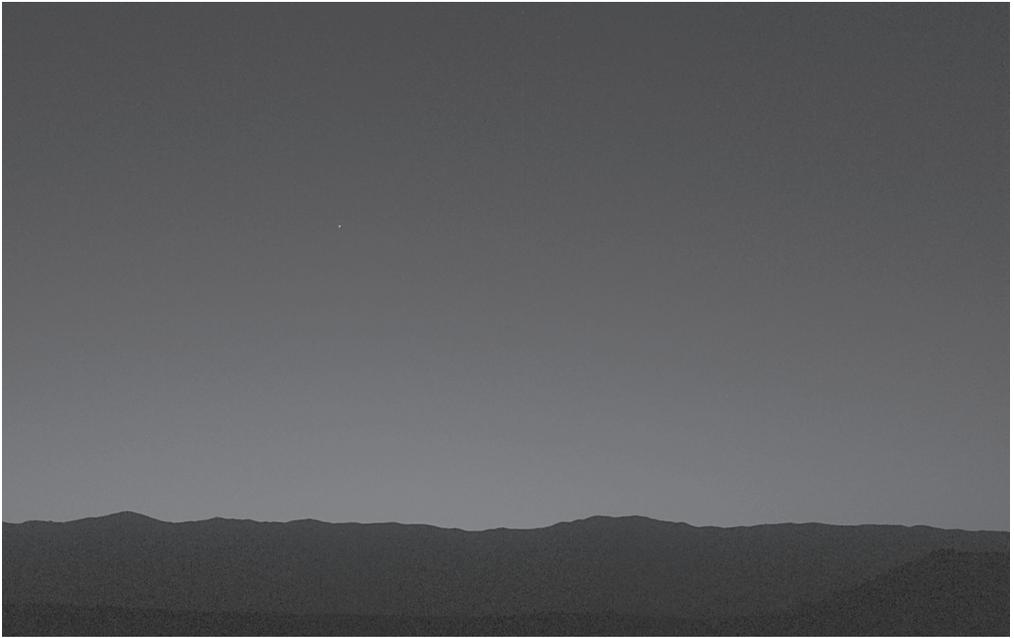


Fig. 1.1. *Earth Seen from Mars*. NASA/JPL-Caltech/M555/TAMU

their home planet and settle on a dusty, cold little rock halfway across our solar system and never, ever come back. With the problem of bringing them “home” solved, both Elon Musk—the founder of X.com, Tesla, and SpaceX—and the Dutch organization Mars One has begun setting up the infrastructure to facilitate a mission to Mars, with a departure date set for some time after 2030 and plans never to return. These new astronauts will need to say goodbye to their families, their communities, and breathable air—all of which are well beyond creature comforts—and set sail for a new home where Earth is only a blue star low on the evening horizon.

This raises one of the most interesting questions of the last half century: What is so meaningful about space that otherwise reasonable people, who planned on living out their lives on our little watery world, are practically falling over themselves for the opportunity to go to Mars? The two planets are a study in opposites—one warm and full of life, one cold and barren—but these crucial differences don’t seem to be slowing the onslaught of would-be Martians. As with all of our planetary neighbors, it is the idea of Mars as an *unexplored*

frontier that has gotten under our skin. Perhaps it is not only the excitement of reaching another planet that tempts us to try but the notion of the opportunity to explore and to settle a new frontier that sticks in the imagination and catches on our ambition.

What is taken for granted in this interplanetary land rush, however, is the *idea* of outer space as a frontier to be crossed and conquered. While humanity seems to collectively understand the concept of a terrestrial frontier, there is a jump in logic—a leap of faith, if you will—that expands outward from unexplored Earth to an undiscovered solar system. So perhaps a better question is where did humanity get the idea that outer space is a frontier waiting to be explored? How a connection was made in the mid-twentieth century between the material frontiers of previous centuries—from the Romans looking north and west at the dawn of the common era to European Americans eyeing the great western unknown on the other side of the Ohio River Valley in the nineteenth century—and imagined frontiers on other planets is a remarkable history of imagination and faith. It is a story that has little to do with the political mechanizations and Cold War strife we associate with the history of the space race and everything to do with the *invention* of space as frontier. Once outer space was conflated into the cultural touchstone of frontiers, reaching out to explore the solar system became a familiar project. And once space had a connotation with both religious and historical resonance, the leap from the terrestrial to infinite space didn't seem so large.

The idea of slipping Earth's gravity and reaching another planet was an article of faith taken to its logical end by an extraordinary group of people after the Second World War. Many spent their lives preparing themselves to help humanity reach outer space. From childhood onward these space proselytizers devoted their time, educations, and careers to engaging the American public through popular print and media to illustrate the scientific and technological viability of space exploration. Their vision was built on faith in their purpose and shaped by confidence in their science, and for some it was inextricably united with a sense of religious compulsion to answer a call by God to explore the heavens and to escape the inevitable cataclysm that would befall Earth. From the end of the Second World War through the beginning of the Cold War, this group of people worked to educate America not only on the feasibility of reaching and exploring other planets but on the spiritual necessity of making the journey. While other histories of the space race paint a picture of a nation mobilized by political

and ideological *fears*, these cultural creators tell the story of how an organic movement grew out of technological and scientific *faith*—and religious anxieties about a man-made Armageddon—and merged with a deep-seated belief in a sense of divine destiny to reach the heavens. With that in mind, this book explores the connection between the art of Chesley Bonestell, an architect who became the father of modern space art, and the popularity of that art in the Cold War United States; Bonestell’s working partnership with science writer and rocket expert Willy Ley; and Ley and Bonestell’s relationship with Wernher von Braun, the father of both the V-2 missile and the Saturn V rocket, whose millennial conviction that God wanted humankind to leave Earth and explore other planets animated his life’s work.

Besides a history of space boosterism and the people who sold space to the American people, *Destined for the Stars: Faith, the Future, and America’s Final Frontier* explores how a scientific idea often owes its genesis to the religious history of its culture.² Specifically, this book examines the popularization of the science of space exploration in America between the years 1944 and 1955 and contends that the success of the US space program was not due to technological or economic superiority but was sustained by a culture that had long valued faith above other religious feeling and believed they were called by God to settle new frontiers and to prepare for the end of time. Viewed against the work of “space exploration proselytizers” beginning in 1944, it becomes clear that religious forces were in no small way responsible for the crescendo of support for and interest in space exploration in the early 1950s, well before Project Mercury began in 1959.

By this reasoning, the Moon landing of 1969 was not just the culmination of a great leap forward in technology and scientific knowledge accomplished in only a decade. One historical narrative of the space race claims that after years of flailing away at building rockets that exploded on the launch pad and satellites that failed spectacularly, the United States finally pulled ahead and rode a flaming Saturn V out of the Earth’s atmosphere to the Moon, winning the space race. It is a somewhat cliché history that meets all the marks of an excellent story: the scrappy underdog coming from behind, the last-minute Hail Mary pass, the “right stuff” merging with technological superiority. The problem with this version of events is that it ignores two important elements. The seeds of the popularization of space exploration in contemporary media after the Second World War were sown well before the Soviet space program was generally acknowl-

edged to be a threat to America's program, and that popularization drew heavily and purposefully on the patterns of American religious belief of the previous century. Specifically, the postwar popularizers of space exploration deliberately tied the twentieth-century "conquest of space" to the nineteenth-century conquest of the American frontier, using a variety of media to spread their message of exploration in ways similar to the expansionist boosters of the 1800s. Most importantly, however, this Cold War cultural work revitalized a *type* of religious faith that faded with the closing of the American frontier: faith in a calling by God to explore, to settle, to build a new Israel in a new world, and to prepare the nation for God's final judgment.

With all this in mind, the historical trajectory of this book begins with a series of paintings in *Life* magazine in 1944. The paintings depicted the planet Saturn as it might appear from several of its moons and what the rings would look like from the planet's surface. They were scientifically accurate depictions created by Chesley Bonestell, an amateur astronomer who left a successful career in architecture to become a special effects artist in Hollywood. In his illustrations of the surface of Saturn's moons, Bonestell appropriated the style of artistic representations of the American West from the 1860s onward; he visually contextualized Saturn and its moons as an unexplored frontier by patterning his images on nineteenth-century Hudson River School paintings, which depicted the sublime in the untamed nature of the American frontier. These close resemblances recalled to a Second World War-era audience the civic faith and sense of calling that sustained manifest destiny after the Civil War. Bonestell's images of outer space were the beginning of a crusade to popularize space exploration that relied heavily on American varieties of religious belief. These religious beliefs flourished in the so-called religious marketplace, in which a mix of evangelical Protestantism, Roman Catholicism, and Judaism cohabited in the United States, and provided a contrast to the USSR, where religious belief and practice were all but eliminated. In 1946 Bonestell began collaborating with Willy Ley to publicize the use of rockets as space-faring vehicles; in 1952 they teamed up with Wernher von Braun—former Nazi rocket scientist turned born-again Christian, American citizen, and architect of America's space program—and other space experts to execute a nationwide media blitz on the science of space exploration. Their efforts culminated in several *Disneyland* television specials, beginning with 1955's "Man in Space," one of the most-watched television episodes of its era.

Five years before *Sputnik* and seventeen years before America's moon shot,

Bonestell, Ley, and von Braun showed the waiting world what a future in space would look like. It was a utopian future free of political strife and full of hope, a particularly astonishing sentiment given the fraying atomic armistice that characterized the Cold War. But more than anything, the future illustrated by Bonestell, explained by Ley, and structured by von Braun showed America a new frontier, an unexplored wilderness ripe for conquest, a representation of all the promises of the western frontier of the nineteenth century—freedom, courage, chosenness, and faith in a calling from God. The spiritual enticements of the western American frontier were laid out by these cultural creators who reinvented nineteenth-century faith in the frontier for use in their campaign to conquer space.

The American space program that followed this first crusade to popularize space exploration demonstrates not only that religion and science are often conflated in the popular imagination but that science *needs* religion—the historical rituals, the patterns of faith, modes of personal belief, and habits of the heart that define both institutional religion and private spirituality are also often the root of scientific endeavor. Moreover, the integration of science and religion is part of a larger framework of “ways of knowing”;³ this book serves as a history of the necessity of both science and religion as ways of knowing for locating humanity within the universe. Nowhere in American history is the mutual indebtedness of science and religion so visible as in the decade that preceded the moon shot. While it is true that the American government sponsored an abrupt about-face in the funding of rocketry and satellite research after the frightening night of October 4, 1957—the night of *Sputnik*’s first pass over North America—what is frequently left out of standard histories of the American space program is the decade spent winning American hearts and minds to the cause of space exploration. The outpouring of support for this scientific endeavor was unprecedented in American history; citizens enthusiastically lined up to face a future in space, a brave new world off Earth, a future of exploration and scientific achievement. Faith in the future merged with a sense of divine calling, and this faith was collectively put toward the miraculous possibility of exploring the heavens themselves.

This story begins, then, with the opening of the heavens: the Moon landing in July 1969 and the effect it had on Bonestell, who arguably had as much to do with reaching the Moon’s surface as any scientist or engineer. While to most of the world the Moon landing represented a triumph of technology, to Bonestell and his collaborators it meant something larger, deeper, and much more person-

al. The forces and feelings Bonestell's art tapped to help create that moment are explored in chapter 1, as is the philosophical background of this book, which lays the foundation of the conquest of space as a religious endeavor. Additionally, the first chapter explores this book's secondary claim, which is that a society's religious culture can influence the success of science within that society; the intersection between religion and science indicates that these two institutions aren't as far removed from one another as they might seem.

Chapter 2, Chesley Bonestell's biography, tells the story of the extraordinary confluence of skills and life experiences that went into painting his first images of Saturn, including several decades as an architectural designer and a midlife switch in career to become a special effects artist in Hollywood. This chapter also explains the cultural and scientific origins of his Saturn paintings and looks at the status of the science of astronomy in the 1940s. But astronomy wasn't Bonestell's sole inspiration: he was also inspired by the whole history of the art of the American West, of which he considered himself a part. Thus, the third chapter delves into the historical inspiration for Bonestell's space paintings, the Hudson River School, and the history of popular representations of the nineteenth-century material frontier. In particular, this chapter explores the career of Thomas Moran, an artist whose paintings of the American West are the spiritual progenitors of Bonestell's space art and whose depictions of the undeveloped, unexplored western frontier illuminated for his audience a holy landscape and a new Israel. Paintings by Moran and other Hudson River School artists, including Thomas Cole, Frederic Edwin Church, and Albert Bierstadt, fostered the national sense of manifest destiny in their own time. I assert that by creating paintings that were visually analogous to the work of Moran and others, Bonestell was reawakening that sense of manifest destiny in postwar America.

In chapter 4 we meet Bonestell's creative partner and space technology's champion, Willy Ley, a German-born rocket expert whose ideas about the necessity of exploring the solar system by rocket were based on his personal sense of the connection between God's creation and the discoveries of science. After helping found Germany's most successful rocketry group, Ley fled his homeland for America to escape Hitler's demand that the rockets the group built transform from space-faring vehicles into weapons for the Third Reich. The chapter explores the impressive results of Ley's career as a science journalist and editor in the United States before and during the Second World War, illustrating not

only how his considerable knowledge of rockets calmed the nation during the war but how his unwavering faith that this technology would help humanity reach outer space fostered his readers' belief that a new future in space awaited them after the war. This chapter introduces Bonestell's professional relationship with Ley and the beginnings of their work as an author-illustrator team. While they were first commissioned to write and illustrate technical articles in popular mechanical magazines, their work quickly became more widely known, and their articles in magazines such as *Life* soon opened the opportunity for a book on the science of astronomy and an introduction to the solar system. That book, *The Conquest of Space*, which came out in 1949 and is the subject of chapter 5, was wholly original; it was utterly unlike any book on astronomy that preceded it—popular or otherwise—and inspired a whole generation of readers to pursue careers in the space sciences. In the midst of this partnership and the success of their book, Bonestell was recalled to Hollywood to work on the film *Destination Moon*, the 1950 science fiction classic that helped familiarize Americans with the technical and political aspects of space flight, the importance of which is explored in chapter 6.

Chapter 7 presents space flight's greatest champion and one of America's most controversial heroes, rocket engineer Wernher von Braun. His career in rocketry began while he was a young man in Germany, but his dreams of reaching space at any cost led him through developing weapons for Hitler to building rockets for the United States. His faith in the necessity of reaching space remained undimmed throughout the Second World War and the Cold War, but after his conversion to Christianity, his beliefs about reaching space were joined with a millennial belief that God intended humanity to leave Earth and settle on other planets in the solar system. Von Braun's belief was so infectious that he, Ley, and Bonestell were invited to work with several other space experts and editors on a symposium on space flight in *Collier's* magazine that began in 1952 and continued through 1954, the story of which is recounted in chapter 8.

Chapter 9 explains how the cultural creator himself, Walt Disney, brought these articles to animated life and made them visible to the majority of the American public. On the eve of opening his theme park in Southern California in 1955, Disney was still searching for a theme for Tomorrowland, the segment of the park meant to celebrate humankind's future. When his lead animator, Ward Kimball, showed him the *Collier's* articles, Disney invited Ley and von Braun to California to help produce what would become a three-part *Disneyland*

TV special, which in turn served as the inspiration for Tomorrowland. The Tomorrowland portion of the theme park, contrasted with the Frontierland space of Disneyland, allowed Disney's guests to participate in both the past and the future of America by exploring the nineteenth-century and twentieth-century frontiers. Disney's own faith in the future and millennialist beliefs were reflected in von Braun's vision for the future, and the result was a broad cultural saturation of the concept of a future in space—a vision of a new frontier that began with Bonestell's paintings in 1944 and encompassed Disneyland's Moon Rocket ride in 1955. The conclusion looks at how the dream of space flight and the quest to conquer the final frontier is faring today. While some have said that humanity has lost its desire to explore, others maintain that the vision of these cultural creators lives on—not just in memory and imagination but in a genuine faith that because we've been there before, we can get there again.

What I hope this book will illustrate is that the spirit of the US space program—a spirit of exploration, discovery, courage, and triumph—was kindled in the hearts of millions of Americans well before the schematics for *Sputnik* were even drawn up. Many histories of the US space program describe the advent of “aerospace” and the political and military objectives of NASA. But what we explore here is the work that happened before anyone so much as launched a satellite, the growth of the idea of space in American thought: first as it was made visible in Bonestell's paintings, then as Ley transformed rockets from weapons into spaceships, and finally as the great ringmaster himself, von Braun, stepped onto the national stage to sell space to the American public. I follow the careers of these three men over this relatively short period (1944 through 1955) because although what they accomplished throughout their respective lives was significant, what I find most compelling is their creation of an idea. That idea was space, and between the three of them they wove that idea so indelibly into the hearts and imaginations of Americans by pulling on both historical and religious energies that in only ten years it was hard to remember a time when Americans had not believed space was their new frontier.

Thus, the success of Apollo 11 lies not just in American technological prowess or scientific ingenuity but in the accumulation of faith in faith after the war and a reanimation of the myth of the American frontier. The upswing in this democratized faith in faith in America between 1944 and 1955 was chronicled in 1955 by sociologist of religion Will Herberg, who claimed that America's popular religion was belief in the power of faith and its lived religion was “the

American Way of Life”: the “common religion” and “operative faith of the American people.”⁴ Herberg’s American Way of Life is a matrix of standards, beliefs, and ideas that at bottom “embraces such seemingly incongruous elements as sanitary plumbing . . . and Coca-Cola.”⁵ And yet it was also more than that; it was “anchored in the America’s vision of America. The Puritan’s dream of a new ‘Israel’ and a new ‘Promised Land’ in the New Word,” Herberg argued, “reflect[s] the perennial American conviction that in the New World a new beginning has been made, a new order of things established, vastly different from and superior to the decadent institutions of the Old World.”⁶ This national belief in the superiority of the New World over the Old—of America as the new Israel—was nourished not only by the thousands of immigrants who looked to the New World for something truly new but also by a twentieth-century faith in the national myth of the American frontier that arose out of the settling of the West.

When considered separately, the fictional fantasies of the Old West and the space frontier seem to have little in common with one another with no basis in religion. But taken together and contextualized by a postwar revival of the American frontier myth, the two dichotomous myths reveal a great deal about American religious feeling in the 1950s. In 1976 scholar of religion Mircea Eliade asserted that a cultural fashion—an element of popular culture, a leitmotif in a society’s modern mythologies—represents a religious nostalgia and “reveals something of Western man’s dissatisfactions, drives, and nostalgias.”⁷ More than just a passing fancy, though, these cultural fashions can tell a historian of religion not only about humankind’s discontentment with the modern forms of ancient religious practices but also that “the success of certain ideas or ideologies reveals to us the spiritual and existential situation of all those for whom these ideas or ideologies constitute a kind of soteriology.”⁸ In other words, by reading these cultural fashions, we can extrapolate our understanding of the existential situation of the people who participate in that fashion or movement. Much of our popular culture and cultural interests are, then, according to Eliade, a reflection of our religious nostalgias, a sublimated desire to return to our culture’s most primary and ancient religious concerns.

Thus, with Eliade’s concept as an organizing principle, we can read the cultural fashion of the reinvigorating of the frontier myth in the 1950s and 1960s not just as a reaction to the Cold War or a passing interest in space but as a religious nostalgia for the frontier as an incarnation of Herberg’s American Way of Life. What this book intends to prove on a small scale is that Bonestell’s

paintings recalled to Americans the promise of the frontier; the images of our solar system being explored by tiny, adventurous humans invoked a religious nostalgia of feeling called by God to conquer the American frontier and build a new Israel in the West. The larger intent of this project is to examine the way the space race didn't inspire America's imagination as much as it was *inspired by* America's collective imagination, thus illustrating how religion and science are frequently integrated within a society, whether that society recognizes the integration or not.

The American dream of space exploration—from its origins in the work of people such as von Braun and Ley in the decade after the Second World War to the public outpouring of nostalgia after the retirement of the space shuttle program to the continued attention to the Mars *Curiosity* rover—has been marked by a secular and scientific faith in humankind's destiny to “go where no one has gone before.”⁹ This faith, this space-age manifest destiny, resulted in one of the greatest scientific and engineering projects of all time: the Moon landing on July 21, 1969. But for the purposes of this book, the tipping point for this scientific, technological, and faith-based triumph was a painting featured in *Life* magazine on May 29, 1944, in which a vision of another world executed with such scientific precision and artistic integrity that some mistook it for a photo. Chesley Bonestell's painting of *Saturn as Seen from Titan* is the hinge on which the integration of space, science, technology, faith, the future, and religion turn. His vision of space as a frontier might also be a key to resurrecting that faith and a reason that humanity will continue “to follow knowledge like a sinking star, beyond the utmost bounds of human thought.”¹⁰