Space Exploration as a Metaphor for Transcendence: Psychological Reflections

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A Child of the Space Age

As a child, I had a large map of the moon tacked to the ceiling above my trundle bed. Also, hanging from the ceiling was a mobile of the solar system. My father, a nuclear physicist, used to explain the movement of the earth and the moon around the sun using various objects on the kitchen table such as an orange, an apple, and a saltshaker. On May 5, 1961, when I was just seven years old, my mother woke me up early (west coast time) and led me into the living room in my pajamas to watch on TV Alan Shepard blasting off in a rocket ship from Cape Canaveral, rising up to the edge of space, splashing down in the Atlantic in his space capsule, and then being hauled up into a rescue helicopter. The excitement I felt was absolutely overwhelming, and as I recall it, it was an excitement shared by all my friends at school. In class we each felt moved to draw pictures of rocket ships and astronauts. And my mother saved the next day's newspaper story for me.

My rocket ship drawing

Only twenty days later, on May 25, 1961, President John F. Kennedy delivered a visionary speech pointing the way forward for the country. "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him

safely to the earth." It was a bold and visionary plan in the days of the giants. Shortly thereafter, on July 21, 1961, Gus Grissom went into space, and less than a year later, on February 20, 1962, John Glenn blasted off. Each time, we watched in our pajamas, early in the morning, on our giant bulky television sets. And we, the children of the space age, drew more pictures of rocket ships, by which we helped all the country to imagine a new future.

More of my rockets

Alan Shepard's first American manned flight into space was on May 5, 1961, and Apollo 17 made the sixth and final Apollo landing on the moon on December 11–14, 1972. Between 1961 and 1972, President Kennedy was assassinated, the civil rights movement swung into high gear, rock 'n' roll burst forth with a creative sound, the war in Vietnam raged on, the counterculture exploded across the country, women's rights demonstrators took to the streets, and NASA sent many more astronauts into space and landed twelve men on the moon. I was a young boy and a teenager through all of it, but even then I had the uncanny intuition that during the 1960s and early '70s something extraordinary was happening that had never happened before. History has confirmed that intuition.

On July 10, 1962, the Telstar communications satellite was launched into space on top of a Thor-Delta rocket and placed into orbit to transmit the first television, telephone, and telegraph images. That same year a British rock group, the Tornados, released a popular rock instrumental called "Telstar" and it received major acclaim in the US and England. It was a musical interpretation of the beginning of the space age, with a whirling sense of rising energy and power courageously blasting off into the future. It's an instrumental conveying a surging power that moves me to this day, and many others have spoken of its very emotional effect on them as well.[1]

Telstar satellite

The Mercury, Gemini, and Apollo space programs came one after another as the US entered into a space race with the Soviet Union. Who would be the first to put a man on the moon?

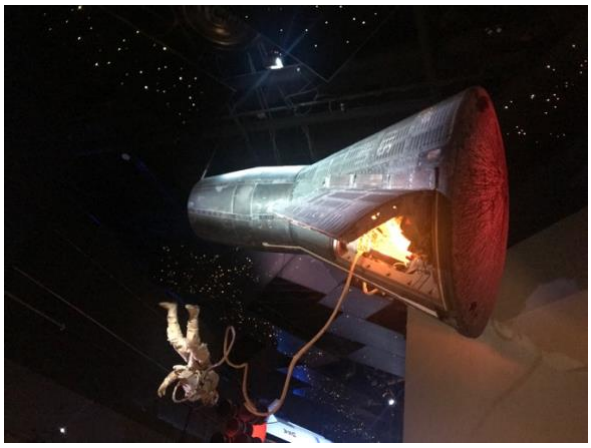
If we, the American public, took less and less notice of each subsequent flight, it was only because we came to expect nothing less than astonishing feats from NASA, could not possibly understand the technology involved, and could no longer tolerate the overwhelming awe of these modern-day miracles and real-life heroes. We were living in extraordinary times, hurtling through space and into an unimaginable future.

Space Exploration and Sexual Curiosity

The adventure of space exploration is characterized by undeniably phallic imagery, unleashed ambition, explosive power, dizzying heights, and inconceivable speeds. But it is also about the limitless feminine space of the universe. As astronaut Charlie Duke wrote, "It's hard to describe the vitality of darkness."[2] Throughout history—and even prehistory—people have projected their psychology onto the walls of the universe, marveling at the heavenly bodies and sensuous orbs suspended in the night sky and imagined its gods and goddesses residing in the heavens. One could retroactively critique the lack of female astronauts, but, alas, those were the times. Nonetheless, space exploration openly embraced mankind and the fraternity of male astronauts. After the Mercury, Gemini, and Apollo missions, the next generations of astronauts have included many women who have brought other talents and perspectives to space exploration and inspired countless young girls to consider careers in space, science, technology, engineering, and mathematics.

Long before the space age, hero mythology around the world was organized around male heroes, but there was and is always a corresponding feminine presence represented by Mother Goddesses, female monsters, damsels in distress, muses, heroines, and helpful female spirits along the way. The same was true in the early days of NASA, when women worked throughout the space agency or supported astronauts and engineers as mothers, girlfriends, wives, and daughters. The metaphoric feminine surrounds the entire enterprise of space exploration. Space vehicles take their maiden flights, penetrate virgin territory, and astronauts and unmanned rovers spy like voyeurs on

the previously unseen secrets of Mother Nature's mysteries. When a space walker engages in extravehicular activity (EVA), he/she opens the hatch and departs the space capsule like a baby leaving the womb, tethered by an umbilical life support system.



The lunar vehicle separates from the lunar orbiter like a child making its first foray away from its mother and then returns to dock again, to reattach to the mothership. Space exploration fills us with the wonders not only of sex and birth but also of the origins of the earth, the solar system, and the universe itself. It fills us with wonder, with awe, and with inspiration to continue the adventure of discovery. And when they return to Earth, astronauts are often seen as being exceptionally sexy, romantically desirable, and sometimes even treated like heartthrob rock stars.

Neil Armstrong greeting people in Houston after his return from the Moon

The Mercury, Gemini, and Apollo programs were at the cutting edge of technology in their day, but now, over a half century later, we have technological precision, power, and capacities previously undreamed of. Our spaceships can endure pressures, temperatures, radiation, and unimaginable speeds. The space suits cost millions of dollars to research, design, and construct to protect against the forbidding environment of space and life on the moon. And what is encased inside these spacecrafts and space suits? The fragile, vulnerable, soft flesh of human beings bearing profound thoughts, tender feelings, desperate fears, eternal hopes, unimagined dreams, curiosity

without limit, the courage that comes with purpose, and the wonder to carry us onward to the next world and then the one after that.

Our Paleolithic ancestors huddled together around the flame against the dangers of the night, and our astronauts similarly huddle together to protect each other against the dangers of the blazing sun and dark cosmic night. The psychoanalyst/anthropologist Géza Róheim noted, "Civilization originates in delayed infancy and its function is security. It is a huge network of more or less successful attempts to protect mankind against the danger of object loss, the colossal efforts made by a baby who is afraid of being left alone in the dark."[3] That's it! The fear of being left alone in the dark. But in addition to fear, there is the defiance and courage needed to face that fear. Paul Tillich said courage is the ability to self-affirm in the face of non-being. And our astronauts must find a way to self-affirm before the dangerous, dark, and empty vastness of the universe. Our astronauts, practically sitting on top of one another inside a space capsule, look into each other's eyes and positively affirm one another, saying, "Yes, we can do this. Let us go forward."

Am I being too dramatic? How much fuel did those rockets use on liftoff? Twenty tons of kerosene and hydrogen per second. Yeah, but how fast did those rockets go? Twenty-five-thousand miles an hour. How hot are the sun's rays on the moon? Two-hundred-sixty degrees Fahrenheit. How far away is the International Space Station? Two-hundred-fifty-four miles above the earth. How far away is the moon? Two-hundred-fifty-thousand miles away. Imagine that, two-hundred-fifty-thousand miles away and "floating in a tin can."

Is it really all that dangerous? When the Apollo flights took off, the astronauts were not insured, as there was no life insurance available to them. Instead, "insurance covers" were prepared. Insurance covers were envelopes that all the crew members of each flight signed. A card inside briefly described each astronaut in the past tense. The envelope was then sent through the mail and canceled at the post office on the day of liftoff. If the crew members were to die during the mission, the envelopes would be sold to raise money for the astronauts' widows and their families. That's how dangerous it was. That's how dangerous it is.

Apollo 11 insurance cover signed by Michael Collins, Neil Armstrong, and Buzz Aldrin. Notice the postage stamp is a photo is of the Apollo 8 *Earthrise*.

Well, of course space exploration is dangerous, but did anyone ever really die from it? Oh, yes, they did!

Theodore Freeman died in a training mission on a T-38 jet crash in 1964.

Charles Bassett died in a training mission on a T-38 jet crash in 1966.

Elliot See died in a training mission on a T-38 jet crash in 1966.

Robert Chaffee died in the Apollo 1 space capsule fire during training exercises in 1967.

Virgil "Gus" Grissom died in the Apollo 1 space capsule fire during training exercises in 1967.

Edward White died in the Apollo 1 space capsule fire during training exercises in 1967.

Clifton Williams died in a training mission on a T-38 jet crash in 1967.

Michael J. Adams died in a training mission on a X-15 jet crash in 1967.

Robert H. Lawrence Jr. died in a training mission on an F-104 Starfighter crash in 1967.

Gregory Jarvis died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Christa McAuliffe died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Ron McNair died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Ellison Onizuka died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Judith Resnick died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Francis Scobee died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Michael Smith died in the Space Shuttle *Challenger* explosion on takeoff in 1986.

Michael Anderson died in the *Columbia* space shuttle explosion on reentry in 2003.

David Brown died in the *Columbia* space shuttle explosion on reentry in 2003.

Kalpana Chawla died in the *Columbia* space shuttle explosion on reentry in 2003.

Laurel Clark died in the *Columbia* space shuttle explosion on reentry 2003.

Rick Husband died in the *Columbia* space shuttle explosion on reentry in 2003.

William McCool died in the *Columbia* space shuttle explosion on reentry in 2003.

Ilan Roman died in the *Columbia* space shuttle explosion on reentry in 2003.

Michael Alsbury died in a test flight of *SpaceShipTwo* for Virgin Galactic in 2014.[4]

I was getting ready to go to a class one morning in 1986 when I took time out to watch the inspiring liftoff of the *Challenger*. I never get used to the majesty and awe of liftoff, and the *Challenger* was no exception. It climbed higher and higher into the sky . . . and then something happened. A member of the cool and calm NASA launch team said in a clear monotone, "Flight controllers here looking very carefully at the situation. Obviously, a major malfunction." The space shuttle had exploded in a chaos of white clouds of smoke against a glorious blue sky. Then small parts of the shuttle came raining down, leaving trails of smoke behind them. And as the eerily shaped trails from the explosion lingered in the sky, I sobbed my eyes out and heard an animal-like howl coming out of me. The worst thing had happened. Horrible. In 2003 the *Columbia* space shuttle broke up on reentry. I didn't see it live on TV, but when I saw the news films of the event, it still broke my heart. It's a dangerous job. There's no doubt about it. Soviet cosmonauts have also died in the effort to explore space. In 1971 Georgi Dobrovolski, Vladislav Volkov, and Viktor Patsayev were returning to Earth in Soyuz 11 when a faulty valve burst and depressurized the cabin on reentry. Tragically, all three men were found dead upon landing. After an otherwise successful mission, the three cosmonauts had suffocated to death.[5]

And even when death is avoided, it is still a dangerous enterprise. Every flight is full of mishaps and emergencies of one form or another that need to be addressed by the astronauts and the engineers at Mission Control. The three astronauts (Jim Lovell, Jack Swigert and Fred Haise) of Apollo 13, for example, all survived their trip around the moon, but their planned moon landing had to be aborted at the last minute after two oxygen tanks blew up. Their mission was not completed but they all got a chance to orbit the moon, and better yet, lived to tell the story!

We wish our astronauts a safe journey specifically because we know there are great risks involved. American astronauts have returned to Earth splashing down in the ocean, parachuting onto hard earth, landing smoothly in the space shuttle, or, sadly, exploding in flames. We are excited and inspired by the blastoff, the docking with a space station, or a landing on the moon. These extraordinary moments in space emotionally remind us of the toddler's separation from mother, the young adult leaving home, or the hero setting off on a quest. But the landing on planet earth evokes another basic human experience: the experience of "coming home," the return. It marks the end of a heroic journey, a return to the starting place—still the same and yet somehow changed. And those welcoming the astronauts are deeply moved, as the fears they've felt throughout the perilous journey are now relieved in tears of joy.

When the Mercury, Gemini, and Apollo astronauts returned to Earth, it became routine for them to ride in open cars through the main streets of major cities in tickertape parades as triumphant explorers. Their accomplishments were splashed across the front pages of newspapers, and they visited the White House. I was at summer camp when Apollo 11 astronauts Neil Armstrong and Buzz Aldrin walked on the moon. We weren't allowed to watch TV at camp but, fortunately, wisdom prevailed and we were allowed to watch the landing that day. It was hard to realize that what we were watching was really happening. Two people were actually on the moon! It was absolutely overwhelming. And again my sweet mommy saved the newspaper for me!

San Francisco Chronicle

105th Year No. 201 HOME EDITION MONDAY, JULY 21, 1969 10 CENTS GArfield 1-1111

MEN ON MOON

Historic Moment

Astronauts Walk The Lunar Soil

Eagle Lands Close to Target Area

Neil Armstrong and Edwin Aldrin, planted the flag of the United States in the lunar soil

Space Exploration as a Metaphor for Transcendence

When our prehistoric ancestors began linking the changes in the weather with the fertility of plants, they began paying close attention to the heavens and personifying the forces they observed. They found in their sky gods and storm gods both the order of the universe and punishments for violating that order. They appealed to the grace of those gods with eyes lifted upward and hands raised to the heavens. They sought visions at the tops of mountains. They fasted and took visionary drugs that sent them flying into the presence of the gods. The gods were said to be "on high" and became associated with the sun, the moon, the stars, and the constellations of stars. They climbed trees and pillars and built ladders to transcend their world to get closer to the gods. The phallic tree was configured as an axis mundi—a world axis in which the lower end reaches into the underworld, the middle portion belongs to the earthly world, and the top is the communication point with the upper world—the world of the gods. In time, people all around the world built temple mountains and pyramids from which they could commune with the gods in the upper world.

The visionary experiences they achieved were transcendental. They were visions beyond the usual limits of earthly existence and beyond the normal plane of reality. Visionary experiences are unusual, to be sure, but they are also very human and surprisingly common. They are experienced spontaneously, in born-again conversions, in hallucinogenic experiences, under extreme stress, in sensory-deprivation environments, religious experiences, and philosophical contemplation. As the space age generation of baby boomers came of age, they spoke of things being "far out," "out o' sight," "spaced out," and made the factual claim that we are all actually made of stardust. It was a statement that transcended the ho-hum, humdrum boring nature of a profane existence. To

recognize that one is made of stardust is to recognize the miracle of being as a human animal that eats and breathes stardust.

Many in that generation were steeped in the experiences arrived at through the study of science, existential philosophy, and phenomenology. Personal religious experiences, and hallucinogenic drugs also delivered an acute experience of perceiving the miracle of being. Some among the baby boomers no longer saw themselves as conventional people going through the motions of being everyday humans. They saw themselves as miraculous cosmic humanoids walking on the planet Earth. And space exploration further emphasized this phenomenological perspective and provided a set of metaphors pertaining to transcendence.

Throughout our history and prehistory, mankind has transformed the objects of the natural and man-made world into a constellation of metaphors around which to organize our understandings of self and world. The technology for controlling fire became a metaphor for managing the primitive impulses of sex and aggression. The permanent walls of the Neolithic house became a metaphor for the construction of ego boundaries and a man-made world—a man-made cosmos. Prehistoric agriculture became a metaphor for relations between the sexes and the newly dawning awareness of the role of the father in procreation. Ceramics, textile arts, the fermentation of juices into wine, metallurgy, and more became screens for human projections. They became new ways of discovering ourselves out there in the world.

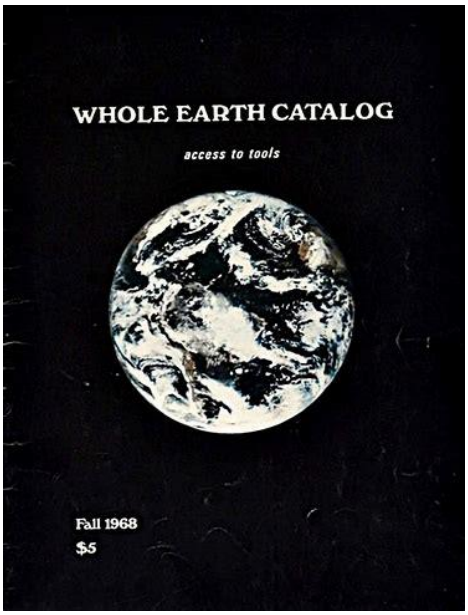
Because of this very human propensity to project meaning into the human body, the life cycle, interpersonal relations, nature, technology, and even the heavens, I maintain that *space exploration, from its very beginnings, and by its very nature offers us metaphors for transcendence*. Space exploration is a literal adventure beyond our earthly plane, with aspects that function as metaphors of personal meaning. It facilitates our thinking out of the box. The view from on high grants perspective and context. It lifts us out of the "maze" of daily life and leaves us "amazed."

The rocket engines ignite a controlled explosion, a continuing thunderous sound erupts, jets and plumes of fire shoot out, and smoke billows while the ground trembles. The rocket rises through the air, beyond the atmosphere, above the Kármán line, where one sees the blue planet below, the curvature of the earth, and the black sky above. Escaping the atmosphere and then Earth's gravity, one rises up, and while rocketing forward, one looks back at the earth below as it shrinks in size. Transcending the earthly plane, we look back and somehow see ourselves in a different way—in a transcendent way.

Earthrise **as a Metaphor for Self-Reflection**

If space exploration is a metaphor for transcendence, the photo of the *Earthrise* from lunar orbit is a metaphor for self-reflection. In 1966 Stewart Brand, in the vanguard of the North American 1960s counterculture, had an LSD trip during which he realized that an image of the whole earth from outer space would transform how we think of ourselves and how we think of the earth. He

campaigned to get NASA to release such an image. In 1967 a NASA satellite (ATS-3) took the photo. It was released to the public, and in 1968 Brand put it on the cover of the first edition of the *Whole Earth Catalog*, a catalog dedicated to living a healthy environmentally responsible life in relation to the planet Earth.[6]



In December 1968 Apollo 8 blasted off with Frank Borman, Jim Lovell, and William Anders on board. They left low-Earth orbit for the first time in history and headed for the moon. The earth began to shrink in size behind them, and the moon loomed larger and larger up ahead. Then, entering the lunar gravitational pull, Apollo 8 began to orbit the moon. On December 24, 1968, the crew witnessed the earth rising up over the horizon of the magnificent but desolate moonscape.

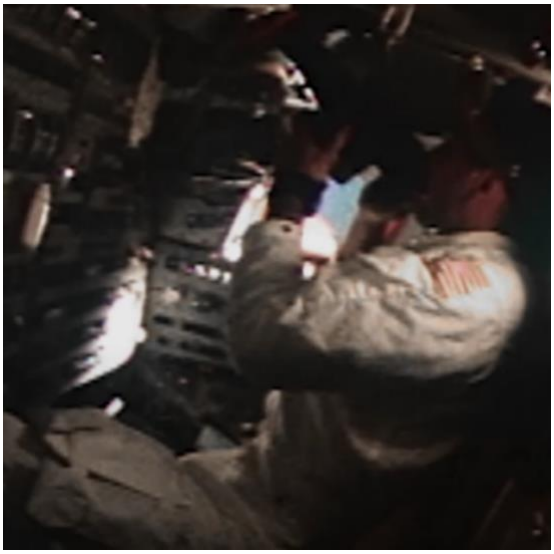
> **William Anders:** Oh my God! Look at that picture over there! Here's the Earth coming up. Wow, that's pretty!
> **Frank Borman:** Hey, don't take that; it's not scheduled. (*joking*)
> [*shutter click of a black-and-white image of the* Earthrise]
> **Anders:** (*laughs*) You got a color film, Jim? Hand me that roll of color quick, will you. . . .
> **Jim Lovell:** Oh man, that's great!
> **Anders:** Hurry. Quick.
> **Borman:** Gee.
> **Lovell:** It's down here.
> **Anders:** Just grab me a color. That color exterior.
> **Lovell:** (*Garbled*)
> **Anders:** Hurry up!
> **Borman:** Got one?
> **Anders:** Yeah, I'm looking for one.
> **Lovell:** C 368.
> **Anders:** Anything, quick.
> **Lovell:** Here.

Anders: Well, I think we missed it.
Lovell: Hey, I got it right here! [*in the hatch window*]
Anders: Let—let me get it out this window. It's a lot clearer.
Lovell: Bill, I got it framed; it's very clear right here.
[*shutter click of the color image of the* Earthrise]
Lovell: You got it?
Anders: Yep.[7]

Earthrise in black-and-white

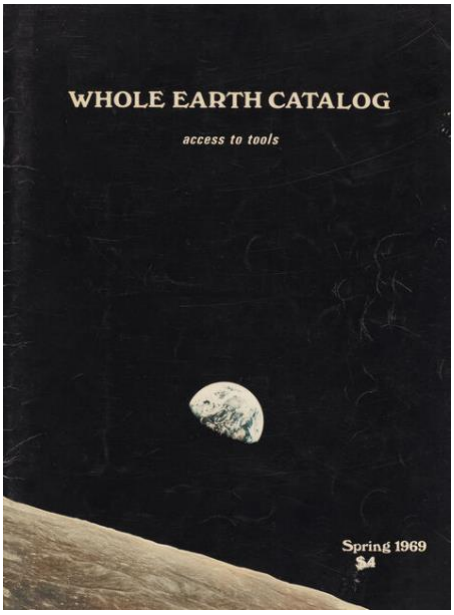
Click!

Earthrise in color



Click!

In that moment William Anders took the photo that arguably became one of the most important photographs in history. It captured the gray moonscape and lunar horizon in the foreground, and floating above it, in the blackness of space, is the distant beautiful blue and white orb of the earth. It was an image never before seen by any person in history. It is an image that immediately flashed around the world. In 2003 Brand said the image "gave the sense that Earth's an island, surrounded by a lot of inhospitable space." It was an image that gave inspiration to the environmental movement that launched the first Earth Day in 1970.[8]



Since then, much has been made of the subjective impact of the *Earthrise*. They call it the "overview effect." Astronauts, many of whom were trained as fighter pilots or engineers, describe the emotional impact of seeing the earth floating in the blackness of night. They describe its extraordinary beauty and the awe that it inspires. Seeing the entirety of the earth in one view, they are impressed by its appearance as a fragile jewel that we need to protect. They notice that there are no apparent borders between countries as are seen on maps, and they feel that people really need to stop their warring and find a way to get along.

I call "space exploration" a metaphor for transcendence and the *Earthrise* a metaphor for self-reflection because through the eyes of our astronauts and our satellites we engage in global self-reflection. We look at ourselves, perceive the miracle of being, behold the preciousness of our planet, feel camaraderie with all people and, indeed, with all living things:

> On April 12, 1961, three weeks before Alan Shepard went into space, the Soviets sent cosmonaut Yuri Gagarin into space, where he orbited the earth. On his return, Gagarin said, "Looking at the earth from afar you realize it is too small for conflict and just big enough for cooperation." "Orbiting the earth in the spaceship I saw how beautiful our planet is. People, let us preserve and increase this beauty, not destroy it!"
>
> Sigmund Jahn, an East German cosmonaut on Soyuz in 1978, said, "Before I flew, I was already aware how small and vulnerable our planet is; but only when I saw it from space, in all its ineffable beauty and fragility, did I realize that humankind's most urgent task is to cherish and preserve it for future generations."

Gene Cernan, an astronaut on Gemini 9A, Apollo 10, and Apollo 17, said, "You . . . say to yourself, 'That's humanity, love, feeling, and thought.' You don't see the barriers of color and religion and politics that divide this world."

Neil Armstrong, Apollo 11 astronaut and first man to set foot on the moon, noted, "It suddenly struck me that that tiny pea, pretty and blue, was the Earth. I put up my thumb and shut one eye, and my thumb blotted out the planet Earth. I didn't feel like a giant. I felt very, very small."

Don L. Lind, space shuttle astronaut and STS-51-B mission specialist, reflected, "Intellectually, I knew what to expect. I have probably looked at as many pictures from space as anybody . . . so I knew exactly what I was going to see. . . . But there is no way you can be prepared for the emotional impact. . . . It brought tears to my eyes."

Richard Garriot, a space tourist on a Soyuz flight to the International Space Station, said, "It was like drinking from a fire hose of information. . . . I had heard of the Overview Effect but, having done many extreme things in my life . . . skydiving, mountain climbing, visiting the Titanic and Antarctica, I didn't think it would greatly affect me. . . . That is until . . . I got into space! My life has changed because of my space experience."

Edward Gibson, astronaut and Skylab 4 pilot, commented, "You see how diminutive your life and concerns are compared to other things in the universe. . . . The result is that you enjoy the life that is before you. . . . It allows you to have inner peace."

Jeff Hoffman, space shuttle astronaut, remarked, "You do, from that perspective, see the Earth as a planet. You see the sun as a star—we see the sun in a blue sky, but up there, you see the sun in a black sky. So, yeah, you are seeing it from the cosmic perspective."

Nicole Stott, space shuttle/ISS astronaut, said, "We have this connection to Earth. I mean, it's our home. And I don't know how you can come back and not, in some way, be changed. It may be subtle. You see differences in different people in their general response when they come back from space. But I think, collectively, everybody has that emblazoned on their memories, the way the planet looks. You can't take that lightly."

Russell "Rusty" Schweikart, Apollo 9 astronaut, said, "When you go around the Earth in an hour and a half, you begin to recognize that your identity is with that

> whole thing. That makes a change. . . . It comes through to you so powerfully that you're the sensing element for Man."
>
> Alan Shepard, Apollo 14 astronaut, confessed, "When I first looked back at the Earth, standing on the Moon, I cried."[9]

It is important to keep in mind that the "overview effect" of seeing the earth from outer space is one that is unique to space exploration, but it is not the only way to arrive at such emotion and understanding of world unity. This transcendent experience of the overview effect is one of awe. Awe is that overwhelming perception of beauty and unity that floods the psyche and moves us to poetry and tears. It may be perceived in the eyes of a lover, in a sunset from a mountain top, in a baby's smile, in a desert sunrise, in the aesthetics of nature, and so much more. The great visionaries of all time speak of the unity of the world and the reverberating love of the universe. But in the hustle and bustle of international politics, war and commerce, culture and economics, it took the *Earthrise* to stop all of us in our tracks and say, "Whoa! Wait a minute! This is who we are. This is what we are. This is where we are. And because of this, we cannot continue in the same way. We must change our lives."[10]

Astronomer Carl Sagan, referring to the image of the earth as a "pale blue dot," said, "That's home. That's us. On it everyone you love, everyone you know, everyone you ever heard of, every human being who ever was, lived out their lives. . . . There is perhaps no better a demonstration of the folly of human conceits than this distant image of our tiny world. To me, it underscores our responsibility to deal more kindly with one another, and to preserve and cherish the pale blue dot, the only home we've ever known."[11]

On November 10, 1988, I had the opportunity to meet the world-renown physicist Stephen Hawking during a visit he made to San Francisco. After his lecture, delivered through his computer-generated voice, I asked him what he might have to say about the psychological and societal implications of the new cosmology. Using only the movement of his thumb, he programmed his response into his computer, and several minutes later his reply issued forth in a hollow monotone: "That is very difficult, but if people study the universe, they will realize how insignificant our political problems are."

In January 2015 Hawking elaborated on the same theme in his speech to the World Economic Forum in Davos, Switzerland: "One of the great revelations of the Space Age has been the perspective it has given humanity on ourselves. When we see the earth from space, we see ourselves as a whole. We see the unity and not the divisions. It is such a simple image with a compelling message. One planet. One human race. We are here together and we need to live together with tolerance and respect. We must become Global Citizens. Our only boundaries are the way we see ourselves. The only borders, the way we see each other."[12]

And on May 21, 2022, I went to the Heritage Flight Museum in Burlington, Washington. It was there that I met the founder of the museum, Major General William "Bill" Anders, Apollo 8 astronaut and photographer of the famous *Earthrise* photo. I found him very approachable, understated, and down to earth. I told him I was not a pilot or an engineer but that I have been inspired by space exploration and the *Earthrise* photo for years. He asked what I do for a living. And when I told him I am a clinical psychologist, he said one of his sons is a psychoanalyst. I mentioned that my father was a nuclear physicist and that I grew up with a map of the moon above my bed. He said he used to be on the Atomic Energy Commission and then led me into the museum, where he wanted to show me a disarmed "Genie" on display. The nine-and-a-half-foot-long Douglass Air-2 Genie is an unguided air-to-air rocket that delivered a 1.5 kiloton W25 nuclear warhead that was formerly attached under the wing of an F-89J Scorpion jet-powered aircraft. Bill Anders flew the Scorpion and fired an unarmed Genie in a training mission. The rest of the afternoon I walked around the museum, where I saw old military aircraft, a room dedicated to the 1968 Apollo 8 mission and the *Earthrise* photo, and, for historical context, a room dedicated to the tumultuous national events of 1968.

It was in the *Earthrise* exhibit that I learned that the first photo of the *Earthrise* was not the one we are most familiar with but a black-and-white photo of the earth just rising above the lunar horizon. Beautiful, even in black-and-white!

Landscape photographer Galen Rowell described *Earthrise* as "the most influential environmental photograph ever taken."

Bill Anders said, "It's ironic that the Apollo 8 came to explore the moon but what we really discovered was the earth—small, beautiful, fragile, physically and astronomically insignificant, yet humankind's home that we need to take better care of."[13]

Then it was time for the Heritage Flight Museum air show. The museum is located next to a runway, so the pilots and planes were presented right in front of the visitors. One of the various air show demonstrations featured four planes flying in formation. Two of the pilots were sons of Bill Anders. A third was a friend and colleague of theirs, and the fourth pilot was none other than the eighty-eight-year-old Major General Bill "Viking" Anders!

Major General Bill Anders in his T-34 Mentor preparing for takeoff.


Bill Anders climbing out of his Apollo 8 space capsule in 1968 and out of his T-34 Mentor in 2022.


Me and Major General Bill Anders.

Space Exploration Enters Popular Culture

The sun, the moon, and the stars have been of supreme importance in religious, spiritual, and mystical traditions for thousands of years. But with modern space exploration, space entered into popular culture in TV shows like *Star Trek*, *Lost in Space*, and *My Favorite Martian*; cartoons like

The Jetsons; movies like *2001: A Space Odyssey, Star Wars,* and so much more. Space even entered rock 'n' roll with David Bowie's popular song "Space Oddity":

> For here am I sitting in a tin can
> Far above the world
> Planet Earth is blue
> And there's nothing I can do.[14]

Joni Mitchell's "Woodstock":

> We are stardust
> Billion year old carbon
> We are golden
> Caught in the devil's bargain
> And we've got to get ourselves
> back to the garden.[15]

Barry McGuire's "Eve of Destruction":

> Ah, you may leave here for four days in space
> But when you return, it's the same old place.[16]

And then, on May 12, 2013, life imitated art when Canadian astronaut Chris Hadfield, in a stroke of genius, sang Bowie's "Space Oddity" while *inside* the International Space Station (the International Tin Can!). There he was, singing, far above the world, with views of the planet Earth below drifting past his windows, and his guitar floating in zero gravity. It was a brilliant piece of art, courtesy of science and technology. Astonishing![17]

NASA and God in the Heavens Together

On February 20, 1962, astronaut John Glenn blasted off to become the first American to orbit the planet Earth. As his rocket lifted off, Scott Carpenter at Mission Control said, "Godspeed, John Glenn." It was one of many references to God and religion that punctuate the history of NASA's space exploration.

Ed White, of Gemini 4, was the first to perform a spacewalk in June of 1965. He carried with him a Star of David, a gold crucifix, and a St. Christopher medallion.

On Apollo 8 the astronauts took turns in an inspired reading from the book of Genesis:

> **Bill Anders:** We are now approaching lunar sunrise, and for all the people back on Earth, the crew of Apollo 8 has a message that we would like to send to you: In the beginning God created the heaven and the earth.

And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.
And God said, "Let there be light": and there was light.
And God saw the light, that it was good: and God divided the light from the darkness.

Jim Lovell: And God called the light Day, and the darkness he called Night.
And the evening and the morning were the first day.
And God said, "Let there be a firmament in the midst of the waters, and let it divide the waters from the waters."
And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so.
And God called the firmament Heaven. And the evening and the morning were the second day.

Frank Borman: And God said, "Let the waters under the heaven be gathered together unto one place, and let the dry land appear": and it was so.
And God called the dry land Earth; and the gathering together of the waters he called the Seas: and God saw that it was good.
And from the crew of Apollo 8, we close with good night, good luck, a Merry Christmas—and God bless all of you, all of you on the good Earth.[18]

Did you get that moment and that scene? There they were, in the lunar capsule orbiting the moon and approaching lunar sunrise. That means they were in the darkness, orbiting the moon, and just as the sun was about to come up over the horizon, they read that "darkness was upon the face of the deep" and then "God said, Let there be light: and there was light." And then the sun came up!

Because of where they were and what they were reading, their words were deeply moving to almost anyone listening, regardless of their religious belief or whether they were religious at all. I, for example, am not a religious person, but their reading underscored that sacred moment, our unique and blessed place in the universe, and the miracle of being.

Buzz Aldrin of Apollo 11 brought to the moon a wafer and a thimble of wine with which to take communion. Microform copies of the Bible were carried on board Apollo 12, 13, and 14.

Ed Mitchell, of Apollo 14, reported a feeling of "universal connectedness" and reported a *savikalpa samadhi*—a deep meditative experience of cosmic oneness. On seeing the earth from the moon, he said, "In outer space you develop an instant global consciousness, a people orientation, an intense dissatisfaction with the state of the world, and a compulsion to do something about it. From out there on the moon, international politics look so petty. You want to grab a politician by the scruff of the neck and drag him a quarter of a million miles out and say, 'Look at that, you son of a bitch.'" "It was a beautiful, harmonious, peaceful-looking planet, blue with white clouds, and one that gave you a deep sense of home, of being, of identity. It is what I prefer to call instant global consciousness."

Apollo 15 astronaut James Irwin felt God all around him and had a Christian rebirth experience in outer space, which after his return to Earth saved his marriage. Interestingly enough, and even after reading from the book of Genesis on Apollo 8, Bill Anders said the first *Earthrise* "really undercut my religious beliefs. The idea that things rotate around the pope and up there is a big supercomputer wondering whether Billy was a good boy yesterday? It doesn't make any sense. I became a big buddy of Richard Dawkins."[19] (Dawkins is a well-known atheist.)

Looking out and seeing the earth rising up over the moon must be a sight to behold, but I saw a pretty amazing thing one night myself, right here on planet Earth. A few years ago, I heard a news report saying that if I looked out at the night sky that evening, gazing toward the north at a certain time, I would be able to see the International Space Station floating in orbit overhead. The idea amazed me, so at the appointed time I began stargazing toward the north. Sure enough, there it was, sailing through the night sky like a very slow moving shooting star. "There it is!" I said to myself. "Wow!" Then I walked into the house. And suddenly it dawned on me. "There are people up there! They're actually up there, floating in that tin can! Amazing!"

Second Half of Life

Sigmund Freud gave us psychosexual development as a way to understand the development of the personality as a function of the infant and child coming to know the world through the experiences of the body, most specifically in relation to the sensations and socialization that takes place around the experiences of the mouth, the anus, and the genitals. But his developmental theory stopped at adolescence when sexual physiognomy and sexual adjustment reach their adult form. One of his students, who later parted company with Freud, was Carl Gustav Jung. From Jung's perspective, Freud's theory made perfect sense, but he just didn't think development stopped at adolescence. In fact, Jung introduced the new idea that there is a later developmental phase called the "second half of life," typically beginning at age forty. Jung's idea was that after the adult personality establishes sexual, familial, and career stability out there in the world, there is a turning inward to unaddressed aspects of the personality, which often take on a spiritual quality. Jung's ideas of an extended adult development have been picked up by many theorists such as Erik H. Erikson and the midlife crisis theorists such as Elliot Jacques, Daniel Levinson, and others.

I wouldn't say that the second half of life always has a spiritual dimension or is even a turning inward, but it is certainly a time to take stock of one's life. One evaluates one's life and sees what was accomplished and what wasn't. One recognizes that "I'm not twenty-two and I'm also not eighty-two, so where can I turn my attention to find a way to live a more meaningful life?"

The early astronauts typically dedicated themselves to heroic involvement in the external world and finished either their astronautical careers or the peaks of their space travel around age forty. So how ya gonna keep 'em down on the farm after they've been to the moon? How do ya follow an act like that?

Some astronauts post-mission stayed at NASA; many entered the aerospace business, taught in universities, became administrators of museums, became born-again Christians, or entered politics; others gave credence to UFOs, denied that global warming is the result of human activity, promoted paranormal phenomena, struggled with depression, struggled with alcohol, and almost half of the Mercury, Gemini, and Apollo astronauts divorced after their missions into space. The tremendous achievement and the extraordinary fame that followed were often difficult to manage.

Sue Bean, the ex-wife of Alan Bean (Apollo 12, Skylab 3), said that her husband's missions took a toll on their marriage. "After the lunar flight, I think sometimes the guys saw things a little bit differently. That type of experience can't help but change your outlook on the world, and we drifted apart," she said. "I became more independent and basically wanted him to not fly again. He flew two flights and backed up a third, and I think that it probably wasn't a good idea to express my wishes, because he loved doing what he did. There were other ladies that cared about him, and I guess in the end it was more than our marriage could sustain."[20]

Amulets: The Souls of the Astronauts and the Spirit of Adventure

Some people have the impression that space exploration belongs to astronauts. But that's like saying rock 'n' roll belongs to musicians. Space exploration certainly belongs to the astronauts but also to the half million people working at NASA and all the contract aerospace companies that get the rockets off the ground. Furthermore, it also belongs to everyone else who follows and is inspired by the progress of space exploration, including engineers, scientists, fashion designers, musicians, health-care workers, moviemakers, teachers, writers, and, of course, all the children drawing pictures of rocket ships down here on planet Earth. We are all participating in space exploration by letting the metaphors for transcendence and self-reflection influence our lives and inspire our passions toward the development of our own work, whatever that might be.

Among the primates there are various greeting ritualizations, but monkeys and even chimpanzees do not signal good-bye. To signal good-bye, one has to hold a very stable internal image of the other in one's own mind. That stable internal image we might call a soul or a spirit. One hundred thousand years ago the symbolic function in the human brain evolved to such a point that we not only were able to say good-bye but also even invented the funerary ritual by which we say good-bye and fare thee well to the souls of the dead. The capacity to symbolize continued to evolve, and then, fifty thousand years ago, humans elaborated funerary rituals to memorialize the soul, painted and sculpted figures to represent the souls of animals and people, and invented amulets to house the souls of the dead and foster communication with the ancestors.

Amulets are very much in use today, and we see them not only in sacred stones, tombstones, and religious relics, but also in our eagerness to view or obtain historical objects, signed books, a rock star's guitar, a signed baseball, and so on. The Paleolithic spiritual innovation of projecting a soul into an object is one that is still with us. The amulet, as the home of the souls of the ancestors,

gives us a concrete object with which to commune with the spirit of the dead or even with the adventurous spirit of someone still alive. For years now space enthusiasts have been collecting astronautical amulets: photographs and books signed by astronauts, objects used in space flight training, objects that have been flown into space, and even parts of the spacecrafts themselves. People buy pieces of heat shields, parachutes, heat-protective Kapton foil, and more. Each object permits the owners to commune with the spirit of space adventure and be inspired in their own work.

I have a small collection myself. The first item I ever collected was the newspaper coverage of Alan Shepard's flight into space in 1961 that my mother saved for me. In 1971 Shepard went back into space, but this time he went all the way to the moon. In 1994 he and Deke Slayton published their book *Moon Shot*.[21] Shepard went on a book tour and I snuck out of work to go see him. I bought his book, which he signed for me, and I also brought my newspaper clippings from 1961. As he signed his book for me, I said, "I had fun following your trips into space when I was young." To which he replied, "I had fun myself. Most of the time, I had fun." As he signed the old newspaper, he looked at the picture of himself being pulled up from the space capsule into the helicopter above. He said, "Now, that guy's really young. I don't even recognize that guy." And I replied, "You wouldn't have recognized me either!" Yes, there is space but there is also time, and time passes. The framed, signed newspaper hangs on the wall in my office to this day, over sixty years after Shepard's first trip into space. Alan Shepard died in 1998. Time passes.

Signed newspaper photo of astronaut Alan Shepard in 1961

We imagine great things from our astronauts, and sometimes, even if only for a short time, they live up to our expectations. Other times, when they do not, we are curiously disappointed. If they went into space, we imagine, surely they must be all-knowing, wise, kind, model spouses and ideal parents with lives of grace, meaning, and perfection. This illusion was beautifully portrayed in one

episode of the television series *The Crown*, about the British royal family. The episode recreated a period in Prince Philip's life when, in the midst of his midlife crisis, he was desperately searching for meaning. It was 1968 and he was 47 years old. He watched the moon landing of Apollo 11 and was fascinated, along with the rest of the world. Shortly thereafter the astronauts visited Buckingham Palace, and Prince Philip was very eager to meet the astronauts, believing them to be somehow almost superhuman and having acquired great wisdom. It was only logical, or so it seemed, that three men who had done something so heroic were clearly living adventurous and meaningful lives. Their accomplishments inspired the rest of us and stimulated our fantasies of who they were, what it would be like to meet them, or even do something similar ourselves. Yet when Prince Philip met Armstrong, Aldrin, and Collins, he discovered that while they had indeed done something very exceptional, they were, to a great extent, just three very regular guys. How could that be?

In my field of clinical psychology it is a common phenomenon to discover that the patient often develops a fantasy of who the therapist is that may or may not correspond with the actuality of the therapist. We call it *transference*, as it is a transference of an important relationship in the early childhood of the patient onto the person of the therapist. The patient may see the therapist as a parental figure similar to their own or as some sort of ideal parental figure in whom they can imagine their own potential. The astronauts quickly became ideal figures onto whom many projected their ideal selves. I once wrote a letter to Neil Armstrong asking him how he was affected by the sight of the earth from space and also if he had any comment on the transferences that people projected onto him. His research assistant, Holley McVey, replied on his behalf:

> Mr. Armstrong believes all the crew members who saw the Earth from lunar distance were struck by its smallness and fragility. It seemed to affect different individuals in slightly different ways, but he knows of no one who was significantly changed personally by the experience. He believes he was not changed but the volume of correspondence from individuals he does not know has gone up by a substantial amount. He does not know of the transference phenomenon but grants that many people seem to believe that he should know a great deal more than he does about space and many other subjects. (personal letter, August 3, 2006)

In his song "Space Oddity," David Bowie sings:

> This is Ground Control to Major Tom
> You've really made the grade
> And the papers want to know whose shirts you wear
> Now it's time to leave the capsule if you dare.[22]

Why do the papers want to know whose shirts he wears? Can an astronaut's shirts serve as amulets? Of course, they can! If I wear the shirts that Major Tom wears, perhaps I can be like Major Tom––or, better yet, perhaps I can be heroic in my own way, in my own life. And how does one come

to terms with being heroic in some aspects of one's life while also being a regular person with foibles, weaknesses, inadequacies, fears, a human body, and a mortal soul?

One can deny one's heroism, shrink from adventure, hide from passion, and project it all into external hero worship. One can embrace heroism, identify with the heroic, and forget one's own humanity. Or one can hold the tension between being a human animal and being heroic. Elton John sings, "I'm not the man they think I am at home. Oh, no, no, no, I'm a Rocket Man," but he also sings, "I miss the earth so much. I miss my wife. It's lonely out in space, on such a timeless flight."[23] To hold the tension of being a rocket man and a regular guy is to hold the tension of being both heroic and also a very human animal.

I would never wish to minimize the extraordinary accomplishments of the NASA scientists and engineers, the contract companies, and the astronauts themselves. But such an undertaking was first and foremost governmental and political. The fact that Texas and Florida were the centers of space flight in the 1960s meant that the first generation of astronauts were all white, male, and Christian. There were even women and African American astronauts-in-training who were rejected for space missions. In 1961 General Curtis LeMay, chief of the air force told Chuck Yeager, head of the Aerospace Research Pilot School (ARPS) that, "[Attorney General] Bobby Kennedy wants a colored in space. Get one into your course." This communication placed Ed Dwight, the first African American astronaut candidate, on a career track that could have sent him into outer space. Dwight proceeded to Phase II but was not selected by NASA to be an astronaut. He resigned from the Air Force in 1966 due to racial politics. [24]

Fortunately, our country has changed since then (somewhat), and we are already seeing astronauts who represent a far more diverse demographic of the American public. As of 2022, eighteen African Americans, ten Asians, eleven Latinos, and over fifty women have flown in the NASA and private US space programs. Others have participated in the space programs of other nations as well. Significantly, Soviet cosmonaut Valentina Tereshkova was the first woman in space, flying on the Soviets' Vostok 6 on June 6, 1963.

Upon her return, Valentina Tereshkova said, “Once you’ve been in space, you appreciate how small and fragile the earth is. It doesn’t matter what country or what political system you are from. Space brings you together.”[25]

Valentina Tereshkova with Vladimir Putin

The 50th Anniversary of Apollo 16

I’m not a scientist, an engineer, or a jet pilot. I’m a clinical psychologist, and yet space exploration has inspired me for years. It does not inspire me to be an astronaut, but it inspires me to dream big, take chances, persevere, strive toward my potential, and dare to be myself. My own personal “moon shot” is a book that I have been working on for forty-seven years. In the spring of 2022, as I neared completion of my book, *Libido, Culture, and Consciousness: Revisiting Freud’s Totem and Taboo*, I found myself increasingly interested in space exploration. I followed the rocket launches more closely, purchased more astronaut-signed photos, and put them up on my walls to reflect inspiration back to me. And it was around the same time that I learned about the 50th anniversary celebration of the moon landing of Apollo 16. It was a fund-raising event for the Astronaut Scholarship Foundation, and while it was expensive for me, I knew I would regret it if I didn’t go and knew I’d be glad if I did.

I flew to Houston on April 1, checked into my hotel room, and settled in for the night. I got up early the next morning and went to the 10:00 a.m. start of the event. Rick Mastracchio was the emcee. He has flown four missions and logged 227 days in space, working in the International Space Station. He introduced the moderator Doug Ward (a NASA public affairs officer for many years) and the three panelists: Charlie Duke (Apollo 16 astronaut who walked on the moon), Fred Haise (Apollo 13 and space shuttle astronaut), and Jerry Bostick (NASA flight controller who worked in Mission Control during the Mercury, Gemini, Apollo, and Skylab programs). Also in attendance by Zoom was Tony England (who flew in the space shuttle program).

There was a one-hour presentation in which each panelist spoke about the Apollo 16 mission and the other astronauts and engineers and geologists involved. They discussed the various issues they had to deal with during that mission. There were also anecdotes shared about the other Apollo

missions. They talked about the training difficulties encountered, the simulations they went through in preparation for the flight, landing, experimentation, geologic exploration with the lunar rover, and the return to Earth.

For years I've known the story that when Apollo 11 arrived at the moon, they were running low on fuel and with only sixty seconds' worth of fuel they looked out at their landing site and saw that it was covered with rocks and completely unsuitable for landing. They flew fifteen more seconds until they could find a good place to land and brought the *Eagle* down with only forty-five seconds to spare. (I have often told this story to patients preparing to go out on a first date. I say, "Make your plans, have your fantasies, but pay attention to your date. Pay attention to where you are. Relate to what is happening. And get ready to be surprised!") What I learned at the anniversary event is that the same thing happened with Apollo 16 and, I think, the other Apollo lunar landings as well. They all had a lunar landing site picked out ahead of time and at the last minute needed to look out the window and find a more suitable place to land.

Another issue Tony England emphasized was that robots don't have the same ability to investigate the moon and exercise judgment that human astronauts have. Time and again NASA went to the moon with a set of plans and ideas of what they would find, only to discover that the situation was not what they expected. For Apollo 16 they were expecting to find volcanic rock but instead found breccia, which is a remelted and mixed rock that results from meteor impacts. That surprised all the geologists down on planet Earth and made them change plans regarding the collection of geological samples during the rest of that mission.

Another related theme described by Jerry Bostick was that when NASA got started, they quickly discovered that younger engineers were better than the older, more experienced engineers. They would ask the older engineers to solve a problem, and the old-timers would say it couldn't be done, but the younger engineers would just go out and find a way to do it. The average age at Mission Control in the early days was twenty-nine.

Again, the overriding theme was the importance of having a plan (a fantasy), checking it out, and changing one's approach to deal with the actual situation. A good lesson for life.

Fred Haise and Jerry Bostick talked about the dedication, precision, and passion that so many NASA astronauts and folks in Mission Control possessed. Some of their comments had the nature of a memorial remembrance of people who have since died. This, of course, included Apollo 16 astronauts Ken Mattingly and John Young but also others down on the ground who made it all happen.

One person in the audience asked how they would like Apollo to be remembered in the future. Charlie Duke said:

> I think my desire is to show the advantage of teamwork, purpose, attention to detail and all of the things the team did to motivate [people] to fulfill President Kennedy's call. It takes the team to make the success. It's not just the astronauts. Everybody has a role to play. The lady that sewed the zipper in my space suit—Important job! I don't remember her name, but I got to know her back in those days. Tapped her on the shoulder and ya know, "Thanks for sewing the zipper correctly." Those kinds of things, I think. In the remembrance of Apollo [it] was the first time men left planet Earth to land on another heavenly body.

Jerry Bostick reminded people of the enormous amount of office space taken up by a giant computer with less computing power than we have in our wristwatches today but mentioned that the inquisitive nature and teamwork of all involved were what made them successful.

Doug Ward commented on how they went to the moon using a hand-wired computer with one-tenth of a megabyte of computing power, but they were disciplined and worked hard together. He said future space explorers should also work together and carry forth with the same spirit. He also mentioned in passing that because there is no atmosphere on the moon, the footprints and tire tracks left there by the Apollo missions will still be there long after the Rocky Mountains have completely eroded away!

Doug Ward, Charlie Duke, Fred Haise, Jerry Bostick

Charlie Duke was, for me, the main reason to be there, as I had bought signed photos from his website and other websites and had read with great interest and pleasure his very well written account of his NASA years, *MoonWalker*.[26] Any question I could have had was answered in the book, but I wanted to make some sort of contact with him by asking a question that would be illuminating of his character, and one that would also be of interest to him. Now, Charlie is a guy who was, like many astronauts, quite full of himself and, consequently, after his moonwalk, his marriage was in trouble. A few years later he became a born-again Christian and active in Christian

ministry. He credits this transformation with saving his marriage. So I asked him, "Do you have a favorite Bible story?" He lit up and said, "Yes, in our devotions right now we are reading about Moses, and Moses is an inspiration to us. The Bible is really the story of Jesus, and I started following Jesus in about 1978—for real, ya know! I'd known about him all my life and grew up in the church, Sunday morning stuff, but now its full-time."

At the close of the 50th anniversary celebration of Apollo 16, Charlie Duke took the stage and spoke emotionally about his deceased crewmates, John Young and Ken Mattingly. Then he said:

> My dad was born in 1907 [*Charlie's voice choking with emotion*]. I mean that's four years after the Wright brothers, and you could see what he saw in his generation in aviation. And he could hardly believe that his son walked on the moon. My two boys were five and seven when I was up on the moon, and they didn't think it was any big deal [*Laughter from the audience*]. The whole neighborhood was going to the moon! [*Gales of laughter*]. John Young lived in the neighborhood. Bill Anders was our next-door neighbor. The Armstrongs lived right behind us a block or so. Frank Borman lived in the neighborhood. Let's see . . . Stu Roosa lived in the neighborhood. Ron Evans lived in the neighborhood. Donn Eisle lived in the neighborhood. We had a neighborhood where either your dad was going to the moon or your dad or mom was gonna work in the space program to make it a success. It was a full-time neighborhood opportunity, if you will.
>
> There's a saying from the Doctor Seuss book [*On Beyond Zebra*!], yes, it goes like this [*Charlie's voice suddenly choking with emotion again*]: "Conrad Cornelius O'Donnell O'Dell, a very young man who was learning to spell. 'The A is for ape and the B is for bear. The C is for cat. The H is for hare. . . . Through to Z I know them all well,' said Conrad Cornelius O'Donnell O'Dell. . . . Then he [almost] fell flat on his face on the floor, when I picked up the chalk and drew one other more. . . . For the things that I do and the things that I see I could never spell if I stop with the Z."
>
> And I think that was the attitude of the space program back in Apollo. We weren't gonna stop with the Z. We were going to keep going. We were going to spell things and do things that we never could do unless we thought beyond Z. The mountains we climbed in our generation, as we carried the next generation forward with us, will make a tremendous difference. Because they see the next mountain beyond Z that we couldn't see. It was too much for us, but we carried them along. And in the Astronaut Scholarship Foundation I think that's one of our primary objectives: to give these kids the chance to look beyond Z.
>
> So I thank the sponsors of this event and those who contribute to ASF in such a significant way to make it possible for us to give sixty scholarships this year. Your

> contributions and the hard work the staff does to make it all possible for our kids and grandkids [who] are gonna be seeing beyond Z because of our support for them. Let's don't ever forget that. So thank you for your support of ASF. God bless you and God bless America.[27]

The applause was thunderous. As Charlie Duke spoke of the NASA space program going beyond Z and of helping the next generation to go further than his generation had traveled, I suddenly thought of Charlie's comment to me earlier in the day about his interest in the story of Moses. While it was Moses who took his people out of Egypt and led them toward the Promised Land, Moses was not able to go all the way there himself. Moses was too old. He died on the way and the responsibility fell to Joshua to lead the people into the Promised Land. In a sense, everyone who seeks freedom, knowledge, or adventure is always in the position of Moses going as far as they can and leaving it to the next generation to carry on the spirit.

After his very inspiring talk, I approached Charlie again and said, "Charlie, you had mentioned earlier today that your favorite Bible story is the story of Moses. Tonight, in your presentation, I felt you were talking about Moses when you spoke of helping the next generations to go further than you did, just as Moses had glimpsed the Promised Land from afar, while Joshua and his people would be the ones to actually go there. Is this what you had in mind when you mentioned your interest in the story of Moses?" Charlie Duke answered, "I wasn't thinking of that, but I can see what you are saying. What I like about the story of Moses is his perseverance and that he lived to be 120 years old and was strong and with all of his senses intact, good eyesight, and good hearing." Perseverance is certainly an important quality of all NASA employees and anyone intent on getting something done, but it is also the name of the Mars rover that went well beyond John Young and Charlie Duke's lunar rover—well beyond Z.

Giving the next generation a boost up over the fence, taking them as far as we can go, and wishing them Godspeed as they continue on, passing the torch, passing the baton, giving them our blessing as they carry forth beyond where we are here and beyond where we are today—these are the tasks of parents, teachers, authors, mentors, scientists who want their children, students, readers, and proteges to go further still, toward the Promised Land, which is forever just over the next mountain.

When the Apollo 16 astronauts blasted off in 1972, they were each allowed to take a tape cassette of music they liked. Charlie Duke asked a DJ friend of his, Bill Bailey, to put together a collection of country music songs for him to take up into space. His friend compiled a tape of original music from Dolly Parton, Porter Wagoner, Merle Haggard, Buck Owens, Chet Atkins, and Jerry Reid. Charlie took this tape up to the moon and enjoyed it immensely. When he returned to Earth, he played the tape for his musician neighbor Randy Rogers, and then Rogers, along with Robert Earl Keen (The Stryker Brothers), wrote and recorded a country song called "Charlie Duke Took Country Music to the Moon." It is an amusing little song with a catchy tune. It was played at the end of the anniversary gala along with a PowerPoint presentation of scenes from the Apollo 16 mission. It put smiles on everyone's faces and the event ended as a total success.[28]

Meeting Charlie Duke

The next morning, I checked out of my hotel, stored my luggage, and caught a taxi out to the Houston Space Center in time for opening at 9:00 a.m. How do I say this? I was on the verge of crying throughout much of the day and was often tearing up. It was all so magnificent and so overwhelming. The Houston Space Center is a space museum located on the NASA campus. The museum preserves the stories of heroic efforts; incredibly hard work; amazing teamwork and coordination; life-threatening adventures; cutting-edge math, physics, and engineering; unimaginable speeds; incredible distances; mind-boggling temperatures; frightening explosions; and all of it carrying us out to the edge of our knowledge and then beyond. And that, I believe, is what brought tears of awe to my eyes.

The space shuttle on top of a Boeing 747.

In front of the space center is a Boeing 747 with a replica space shuttle mounted on top. Inside the museum are space capsules and space suits, video presentations, photos of astronauts, plans for the return to the moon and the landing on Mars. I took a tour to see the Saturn V rocket and went into the building to see the now preserved Apollo "Mission Control Center." It was used for many of the previous and subsequent missions but is no longer in active use, as the current Mission Control is in some undisclosed location. So now they have the old Apollo Mission Control Center set up just as it was on the day of the Apollo 11 moon landing. The old-fashioned landline phones are there as are headphones, ashtrays full of cigarette butts, notebooks, coffee cups, papers, pencils, briefcases, and other signs of the center's previous life. They have even replicated the scenes on the computer monitors at the time of the *Eagle*'s landing. It was overwhelming to be in this hallowed place.

It was then that I looked around at all the other people on the tour and realized not only that I was the oldest person there (I'm 68) but also that this history of NASA was the backdrop to the history of my own life. I was beginning to further understand the fascination that space exploration has held for me from the early space launches and my childhood drawings of rockets to NASA's current plans to return to the moon and go on to Mars. It's a story parallel to my own life. Those of us on the tour came out of Mission Control, and there in the grass was a thoroughly prehistoric armadillo foraging for food on the lawn. It was incredibly cute—and poignant as well. Space exploration and the prehistoric in the same place!

Houston Mission Control Center.

I saw the Saturn V rocket laying on its side, and as I stood next to one of its engines, I saw the NASA buildings where history was made and where the future is now being constructed.

Saturn V rocket.

I then returned to the space center's main museum, where I saw a broad wall with framed photos of all the American astronauts from the beginning to now—hundreds of astronauts. The first one, of course, was of Alan Shepard. I looked at his image as if we were old friends. I remember him not only from watching him blast off, on our TV, in 1961 but also from when I met him on his book signing tour for his book *Moon Shot*.

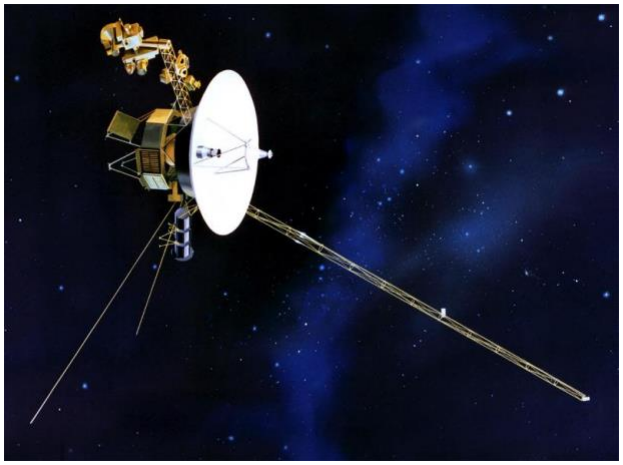
I listened to a few live presentations of museum staffers explaining different aspects of space exploration. One guy was particularly knowledgeable and engaging and threw into his presentation all sorts of funny space puns. At the end of his talk, he said, "For those of you who did not appreciate all of my space puns, I Apollo-gize!"

My two days in Houston had come to an end. The 50th anniversary celebration of Apollo 16 was an over-the-top event, and my visit to the Houston Space Center was for me a sacred pilgrimage. The beauty of nature, the universe, technology, and the human spirit fill me with awe and inspire me to fulfill my own potential on beyond Z.

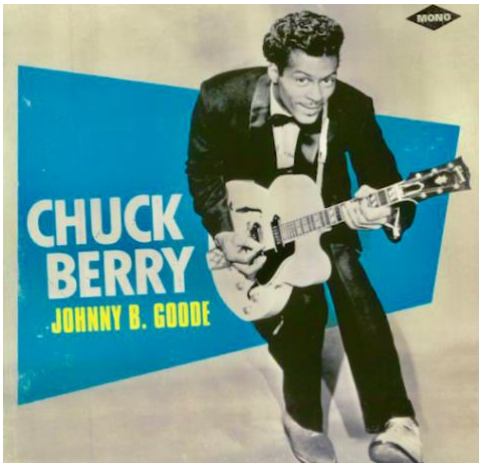
In October 2020 NASA sent up a spacecraft, the OSIRIS-REx, to touch down briefly and collect soil and rock samples from the asteroid Bennu. While the International Space Station is 250 miles above the earth, and the moon is 250,000 miles away, Bennu is more than 200 million miles from us. That might sound rather extraordinary to you but there is no need to be overly impressed, because they did, after all, miss the actual target spot—by three feet! Let me say that again: They sent OSIRIS-REx over 200 million miles away and missed the landing spot by three feet! And that is *well* beyond Z.

Jamie Elsila, a research scientist at Goddard, explained that "one of the prime goals of the [OSIRIS-REx] mission is to understand the origins of the solar system and life on Earth, and the role asteroids may have played in delivering life-forming compounds on Earth." When OSIRIS-REx returns to Earth on September 24, 2023, it will bring the samples back for analysis. But the scientists will only analyze a small portion of the material and set aside three-fourths of the samples for future analyses. Elsila then explained in an awe-inspiring fashion, *"This will allow people not yet born using techniques not yet invented to answer questions not yet asked."*[29]. And all of that is also on beyond Z.

As I finish this essay in June 2022, word has come out that the Voyager 1 space probe is still sailing through deep space and sending signals back to Earth. It was launched on September 5, 1977, and is carrying photos of life on Earth and recordings of animals and humans. The photos and recordings are to inform, whomever might one day find it, of certain important facts about Earth and the human race. I, for one, am comforted to know that on board is a recording of Chuck Berry singing "Johnny B. Goode." And where is Voyager 1? As of today, it is over 14.5 billion miles from Earth—and, of course, that's *way* beyond Z.[30]



Voyager 1 14.5 billion miles away



Chuck Berry – Out o' sight!

In the Earthrise exhibit at the
Heritage Flight Museum, Burlington, Washington

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Notes

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[7] Heritage Flight Museum, Earthrise Gallery display, Burlington, Washington.

[8] "Stewart Brand," *Wikipedia*, https://en.wikipedia.org/wiki/Stewart_Brand/.

[9] Quotes can be found on *Wikipedia* pages of the astronauts or at "14 Awe-Filled Quotes about 'The Overview Effect' from Outer Space," *Phactual*, https://www.phactual.com/14-awe-filled-quotes-about-the-overview-effect-from-outer-space/.

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