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ELON MUSK AND THE FAILURE OF OUR IMAGINATION IN SPACE

Musk and his fellow-"astropreneurs" have tapped into our idealism about space travel. But to what end?

By Ceridwen Dovey June 14, 2018

Astronaut culture has always thrived on exclusivity. Of the more than five hundred people who've so far made the journey into space, only sixty-one have been women.

Illustration by Stephanie Scholz

Long before mastering the mechanics of spaceflight, men imagined sending other men into the cosmos. Cicero, de Bergerac, Godwin, Poe, Verne, Wells: the tone of their tales was sometimes satirical, and the transportation methods varied—moon geese, a space cannon—but,

generally, the gender of the space travellers did not. One exception is "Somnium" (Latin for "dream"), the astronomer Johannes Kepler's treatise on the heliocentric universe disguised as a story, published posthumously, in 1634. In it, a teen-ager discovers that his mother has a celestial mentor, a daemon, whom she summons to take them to the moon. The daemon's criteria for moon trippers are harsh: "We do not admit desk-bound humans into these ranks, nor the fat, nor the foppish," he explains. But "dried-out old women" can make for good spacefarers, since "they are accustomed to riding goats at night, or pitchforks." Witches, he means. It's a joke, one that came back to haunt Kepler when his mother was accused of witchcraft.

Nearly four hundred years later, women are not quite as likely to be burned at the stake, but they still have extremely low odds of getting into space. Of the more than five hundred people who've so far made the journey, only sixty-one have been women (of these, forty-seven were American). The dawning era of private spaceflight is not proving to be especially inclusive, either. In February, Elon Musk's aerospace company, SpaceX, tested its Falcon Heavy rocket, the company's biggest to date, which is designed to carry massive payloads and have reusable parts. Afterward, in a column for the San Diego *Tribune*, the astrophysicist Alison Coil wrote about how disheartening it was to look at the cheering crowd of SpaceX employees and notice that it was a "sea of almost entirely white men." (An Electrek report from 2016 showed that women made up only fourteen per cent of SpaceX's workforce.) The Falcon Heavy's payload, on that maiden launch, was a Tesla Roadster belonging to Musk, with a mannequin dubbed Starman in the driver's seat. Though the mannequin was named for a David Bowie creation, his appearance was more macho than flamboyant: one of his arms was draped over the car door, in a gesture of the one-hand-on-the-wheel steering so beloved of men in convertibles. "Every object humans

have launched into the solar system is a statement," the space archaeologist Alice Gorman wrote, in a piece about SpaceX's iconography, after the launch. "Each tells the story of our attitudes to space at a particular point in time." The photograph of Starman in Musk's midnight-cherry Roadster, Gorman suggested, could qualify as the first "dick pic" taken in space.

For me, the image recalled a scene in Tom Wolfe's 1979 paean to the Mercury Seven, "The Right Stuff," in which the military test pilots turned astronauts race Corvettes and Maseratis at Cocoa Beach, in between bouts of carousing with "young juicy girls with stand-up jugs and full-sprung thighs and conformations so taut and silky that the very sight of them practically pulled a man into the delta of priapic delirium." Only John Glenn refrained, both from the womanizing and the sports-car mania, which made him the butt of the others' jokes. One morning, when the others reported for duty in the Astronaut Office, they found a cautionary message on the blackboard: "Definition of a sports car: A hedge against the male menopause." Glenn may have written this, but he wasn't as enlightened when it came to the question of who should go to space. At a congressional hearing, in 1962, on whether women should be allowed to join the astronaut corps, he testified that they should not. "It is just a fact," he said. "The men go off and fight the wars and fly the airplanes and come back and help design and build and test them."

Musk's Starman followed in the footsteps of earlier test-dummy men: there was Ivan Ivanovich, a life-size mannequin who flew in a Vostok capsule a month before Yuri Gagarin became the first person to venture into space, in 1961; and SuitSat-1, a spacesuit repurposed, in 2006, as a satellite, and nicknamed Mr. Smith; and Mannequin Skywalker, who was sent up, in 2017, in a test of the New Shepard rocket designed by Jeff Bezos's space company, Blue Origin. The few female avatars who've

made it into space have done so with breasts exposed. One of the experimental V-2 rockets created for Hitler, in 1942, by S.S. Major Wernher von Braun—who, after the war, was poached by America to jump-start the space program—bore a logo from a popular German science-fiction film, "Frau im Mond": a naked woman in high-heeled boots, sitting on a crescent moon, straddling a rocket. (When von Braun was asked, in the sixties, about the possibility of female astronauts, he made a sly joke about them being "recreational equipment.") In 2016, when Richard Branson unveiled Virgin Galactic's second SpaceShipTwo, its side displayed an eerily similar image: Galactic Girl, a space-age incarnation of the big-chested woman who graces some of Branson's Virgin Atlantic airplanes. Blond and lily white, Galactic Girl is also supple: she seems to be doing a backbend in a strapless spacesuit, showcasing how perky her bosom is in zero gravity. (She was allegedly designed to resemble Branson's mother, Evette, when she was young.)

Astronaut culture has always thrived on exclusivity. In the earliest years of the space age, during the Cold War, the high status of astronauts was linked to who was barred from the applicant pool—it would have dented the prestige of spaceflight, for both Soviets and Americans, if it were so simple that a *woman* could do it. "The exclusion of women and racial minorities from the pioneering astronauts corps of the 1950s and 1960s was a deliberate gesture," De Witt Douglas Kilgore argues in his book "Astrofuturism: Science, Race, and Visions of Utopia in Space," from 2003. Musk and his fellow-"astropreneurs" talk about democratizing space travel; Branson has said that his company's goal is to make space accessible, because "by doing that we can truly bring positive change to life on Earth." In this view, the fastest way to get more women into space is by backing space-tourism startups, trusting that they will open the cosmos to the masses (once the super-wealthy

have had their fun). But it's not enough to promise women that one day they, too, could become passengers to space. As Ryan Jenkins, a Cal Poly ethicist who writes about emerging technologies, told me, "democratization is not only about access but about input. Who is able to guide and shape these activities?"

In "Space Barons: Elon Musk, Jeff Bezos, and the Quest to Colonize the Cosmos," Christian Davenport tells the backstories of the billionaires who are vying for control of the emerging NewSpace industry. In addition to Musk and Bezos, Davenport writes about Branson and Paul Allen, the co-founder of Microsoft and an early investor in new spaceflight technologies. The members of the quartet are so similar in type that their biographies, as Davenport relates them, start to blur into one. As boys, they mostly read the same science fiction. (Musk has said that his favorite Robert A. Heinlein novel is "The Moon Is a Harsh Mistress," which is set on a lunar colony where young girls marry men and women are either homemakers or work at beauty shops or brothels.) The space barons were all outsiders as young men; they're all obsessed with rockets; they all want, more than anything, to win. Their space ventures are supposedly driven by a common goal of elevating or saving humankind, but they don't always treat others humanely.

In his acknowledgments, Davenport admits that it's "awkward writing a book about someone who could have you fired" (Bezos owns the Washington *Post*, where Davenport works) but claims that Bezos gets "the same treatment in these pages" as the other men. I would say that's true, but mostly because Davenport treats all of the barons as heroic saviors of the crumbling dreams of the space age, boldly taking charge of our destiny. "Instead of hoping Kennedy would rise from the grave and give them the space program they wanted," Davenport writes, "maybe they were, themselves, the people they'd been waiting for."

Seemingly dazzled by these billionaires, and fascinated by their cutthroat competition to dominate private space services and travel, Davenport situates himself firmly within the booster tradition established by Wolfe and Norman Mailer, whose "Of a Fire on the Moon," which was drawn from his reporting for *Life* on the Apollo space launch, was published in 1971. Unsurprisingly, phallic metaphors, many of them deployed by the barons themselves, abound in "Space Barons." A Musk fan posts an image, on Twitter, of Blue Origin's rocket beside SpaceX's, in order "to illustrate," Davenport notes, "how the endowed Falcon 9 made the New Shepard look prepubescent by comparison." When Blue Origin contests SpaceX's purchase of the historic launch pad 39A, at the Kennedy Space Center, Musk calls it "launch site envy." Watching SpaceShipOne soar in an early test, Davenport reports that Branson turned to Allen and said, "Paul, isn't this better than the best sex you ever had?"

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Women make rare appearances in "Space Barons," and nearly always as mothers, killjoys, or sex symbols. Gwynne Shotwell, the president and C.O.O. of SpaceX, is mentioned only a few times; Davenport notes that she dubbed herself the "party mommy" and cared for the drunk

engineers at post-launch celebrations. When Branson slings "a scantily clad Pamela Anderson awkwardly over his shoulder so that her breasts fell out of her revealing red dress," at Virgin Atlantic's twenty-first anniversary party, Davenport describes it as an example of Branson's "cool and sexy" approach, a "very Branson 'screw-it-let's-do-it' freedom." He recounts a story of Bezos giving a talk to a space-enthusiasts club that he joined when he was a student at Princeton, describing in detail how asteroids could be colonized as dwellings for humans. A female student at the back of the class says "How dare you rape the universe!" and storms out. The punch line is given to Bezos: "Did I hear her right? Did she really just defend the inalienable rights of barren rocks?"

In fact, the young woman had a valid legal point. Under the terms of Article II of the U.N.'s Outer Space Treaty, from 1967, to which the U.S. is an original signatory, the moon and other celestial bodies, such as asteroids, are "not subject to national appropriation by claim of

sovereignty, by means of use or occupation." Permanent ownership claims to an asteroid, whether by a company or a bunch of college space nerds, are unlawful—some might even say rapacious. So, yes, there are a few rights associated with that barren rock.

The asteroid anecdote inadvertently highlights a contradiction in the astropreneurs' approach that Davenport mostly glosses over: while the space barons are happy to take large amounts of government funding, they're quick to complain when the government attempts any oversight of their endeavors. SpaceX's first Falcon 1 rocket was partly funded by the government and launched from a government facility. When the first launch attempt ended in an explosion, in 2006, a NASA official, knowing that an investigation into the failure would be required, tried to take charge of cataloguing the debris. Musk was furious at what he saw as interference in his company's affairs. Davenport seems to take his side, quoting the NASA official himself excusing Musk for this behavior: "You couldn't blame him. This was his money, and he had put $100 million into it."

In 2014, a SpaceShipTwo crash killed the pilot Michael Alsbury, and a federal investigation found that his death resulted, as Davenport reported elsewhere, from a "combination of pilot error and the systematic failure to implement basic safeguards," including proper training for pilots. In "Space Barons," though, Davenport frames the incident as a test of Virgin Galactic's heroic resolve. "This was their crucible, their Apollo 1 moment," he writes. "The time to decide whether they would retreat or reassemble and attack again stronger." He *is* critical of Blue Origin's obsession with secrecy, and the company's week-long silence, in 2011, after one of its rockets exploded. (The company was working with NASA, and would eventually be awarded government contracts worth $25.7 million.) But mostly he admires the billionaires for banding together to resist Washington's efforts to "stifle a

fledgling industry before it had left the nest." (They now have a fan in the Oval Office, too: at a Cabinet meeting, in March, President Trump gazed at model rockets and gushed about the commercial space industry. "Rich guys, they love rocket ships," he said. "That's good.")

SpaceX named its rocket Falcon as a sop to the Defense Advanced Research Projects Agency initiative of the same name, which the Pentagon described as "a means of delivering a substantial payload from within the continental United States . . . to anywhere on Earth in less than two hours." In other words: a gigantic space weapon. (Davenport reports that DARPA invested several million dollars in SpaceX, which the company used to help fund its first attempted launch.) In 2014, Musk sued the U.S. Air Force, claiming that it had unfairly awarded contracts for national-security launches, which were worth billions, to Lockheed Martin and Boeing's joint venture, United Launch Alliance, leaving SpaceX out in the cold. Davenport describes Musk's lawsuit as "pitting an underdog upstart against the nation's military-industrial complex." But Musk wanted to become part of that lucrative complex—and he succeeded. The Falcon 9 rocket is now certified by the Air Force to launch military satellites, making SpaceX a huge player in the U.S.'s national-security marketplace, able to bid on all military launches. (It's also hoping to receive Air Force certification for Falcon Heavy to compete for launches of more expensive classified national security satellites.)

In January of this year, under extreme secrecy, SpaceX launched a Northrop Grumman spacecraft, code-named Zuma, on a U.S. government contract. (The *Wall Street Journal* described the payload as a spy satellite, and reported that it was lost after failing to reach orbit.) There's a frightening irony lurking in all this. Musk has presented his space ventures in a humanitarian light—he's going to save us by establishing a settlement on Mars, in case we wipe ourselves out. But

the very technologies that he's developing for the Pentagon's use could become the tools of our self-annihilation.

"I belong to an era when astronauts were gods," Marina Benjamin, the author of the book "Rocket Dreams: How the Space Age Shaped Our Vision of a World Beyond," from 2003, told me recently. After the men in the Mercury, Gemini, and Apollo programs became some of the first humans to go to space, all their sins were forgiven: they were transformed into supermen, creating a "zone of awe and reverence wherever they set foot," as Wolfe put it. Neil Armstrong's personal checks were hardly ever cashed, because having the signature of the first man on the moon was like owning a holy relic. While waiting to meet astronauts, "people queued reverentially and in silence, as if in church, as if about to swallow the Eucharist," Benjamin said. This cult endures: Margaret Weitekamp, the curator of space history at the Smithsonian's National Air and Space Museum, described to me the reverence with which visitors gaze at the spacesuits, "especially the early ones, which were individually sized to each astronaut, like couture garments, so they still carry an element of that person in their shape."

The elevated status of astronauts is not only cultural but legal: it's enshrined in the international framework established by the U.N. Committee on the Peaceful Uses of Outer Space. In Article V of the Outer Space Treaty, astronauts are defined as "envoys of mankind." Their unusual protections are affirmed in the Rescue Agreement, from 1968, which mandates that astronauts be given rights to safe rescue and return "in the event of accident, distress or emergency." The treaty proclaims that outer space be used for peaceful purposes and "for the benefit of all peoples"; it follows that anyone journeying there should do so with only the best of intentions for humanity.

The space barons are shrewdly—one might say cynically—tapping into

our respect for astronauts and our idealism about what space represents. They seem to be counting on us to be awestruck by whatever it is they do in space, and to overlook the fact that their motives are not exactly pure, nor are their methods of getting us there egalitarian. At the moment, they have almost total control over the narrative of what space is and can be for humankind. In "The Human Condition," from 1958, the political philosopher Hannah Arendt wondered whether the dawn of the space age meant that we are fated to repudiate "an Earth who was the Mother of all living creatures under the sky." Her fears may have been warranted. Today, a mogul like Musk can help create a rocket-weapon of extraordinary destructive power while also preaching that we should become a "multi-planetary species." His insistence that we need to establish a backup civilization elsewhere could be the first small step toward renouncing the Earth as a wasteland, rather than tending to it as the only paradise we might ever know.

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