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IN SEARCH OF A MARTIAN FAITH

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Abstract

When humans go to Mars, they will take religion with them. But what will that look like, and what challenges to religious practice will those future migrants face? In this paper, I describe a little of my personal experience as a scientist and Mars One candidate of faith, and use the religious makeup of the Mars 100 as an example case to explore the implications of practicing religion in space and on Mars, with reference to three main problems: community, time, and space. I explore the importance of community to religious people in space and the difficulty faced by a single member of a faith cut off from the rest of their religious community, and argue that this will require compassionate and respectful interfaith support among Mars migrant crews. Using examples from various religions, I discuss the challenges of timekeeping away from Earth and how it affects time-dependent religious observance, and some of the current proposed solutions for astronauts in orbit as well as how Mars migrants may adapt religious ritual to Martian time. I examine the phenomenon of sacred physical locations and spaces, and how Mars migrants will cope with living apart from the planet where every significant religious event to date has happened. Finally, I offer some speculation on what may develop as the sacred and mythic on Mars, as humans bring their sense of awe, wonder and spirit to a new planet.

A Mars One Candidate of Faith

Ps 8:3-Ps 8:4 NIV: "When I consider your heavens, the work of your fingers, the moon and the stars, which you have set in place, what is mankind that you are mindful of them, human beings that you care for them?"

Before I get into the main body of this paper, I would like to introduce myself and my own connection to the topic, since I approach it not so much as an academic but as someone with a personal stake in the issue.

Aside from an attempt at atheism in my first year of university, which lasted all of about a month, I have been a Christian all my life. I would class myself as coming from a charismatic Evangelical subculture – although today I am a happy member of an Episcopal church here in Pasadena.

While some would call it an inherent contradiction, I have found my faith and my career as a scientist to be entirely complementary to one another. The more I learn about how enormous and incredible the Universe is, the more I am able to comprehend an enormous and incredible God. And indeed, my motivation for learning about the Universe is not only to discover more about it, but discover what it says about its Creator. My draw to astronomy feels almost inevitable in that context.

Space taps into the same sense of awe and wonder that I feel when I think about God. We all feel in awe when confronted with something beyond ourselves, and often faith, in whatever form it takes, is a human being's attempt to contextualise, process and understand that awe we owe to the world we live in and where it came from.

That same awe meant that when I stumbled across the Mars One¹ mission to establish a permanent human presence on Mars in 2013, I instantly knew in my gut that I wanted to do it. It took me a little longer after that to think it through before I applied, but I did so in the summer of that year.

The first question I am usually asked about my decision to apply for the Mars One mission is a rather incredulous, "Why?!?" That is a tricky question to give a potted answer to, but usually while answering, I'll touch upon the fact that I want to be a part of advancing human space exploration, that it's one of the greatest scientific opportunities I could have, that I think humanity will eventually expand to live beyond one planet and we need to find good ways to do it when we do. But for me, some of those motives are religious as well.

In my initial application form, as part of an answer explaining my motivations for applying to Mars One, I wrote:

"... Finally, as a Christian, I have a deep love for all creation. Mars is as much God's work as Earth is, and I know that my faith gives me a deep respect for it, as well as a firm emotional grounding for a life-long dedication."

This idea of Mars as God's creation has sat heavily on me throughout this whole process. I think it gives me a slightly different way of seeing a mission to Mars than some of the other Mars One candidates. I see space exploration as an act of worship, glorifying the Creator by seeking to visit and discover more of Their Creation, like a pilgrimage, albeit not one I intend to return from. And I see Mars itself as a place which, like the Earth, does not and should not belong to us as a possession – rather it is a place where we can make a home for ourselves, and have the responsibility for looking after.

Is Religion Going To Mars?

While religious motives intertwine with scientific and social ones for me, lots of people have a lot of different ideas as to why we should settle Mars and what it might look like. Some people hope that civilisation on Mars can leave behind a lot of unhelpful baggage on Earth, such as war, capitalism, or religion. The goal to create a peaceful and non-exploitative society on Mars is certainly one worth pursuing, but it would be naive to believe we could leave everything behind and start completely from scratch. As representatives of humanity in its diversity, it only stands to reason that religion would come with the first humans going to Mars, especially if it's a global mission like Mars One – after all, the majority of the world's population – up to 85% – identifies in some way with a religion².

But if religion is definitely coming with us, what is it going to look like? I took a poll of some of the current 100 Mars One candidates I am in contact with, asking whether they were religious and what they believed. Of just over thirty candidates who responded, there were eleven atheists, eight agnostics or those who subscribed to no religion but didn't particularly profess atheism, and five who considered themselves spiritual but not religious or were

otherwise positively disposed to life having a spiritual element to it without subscribing to a

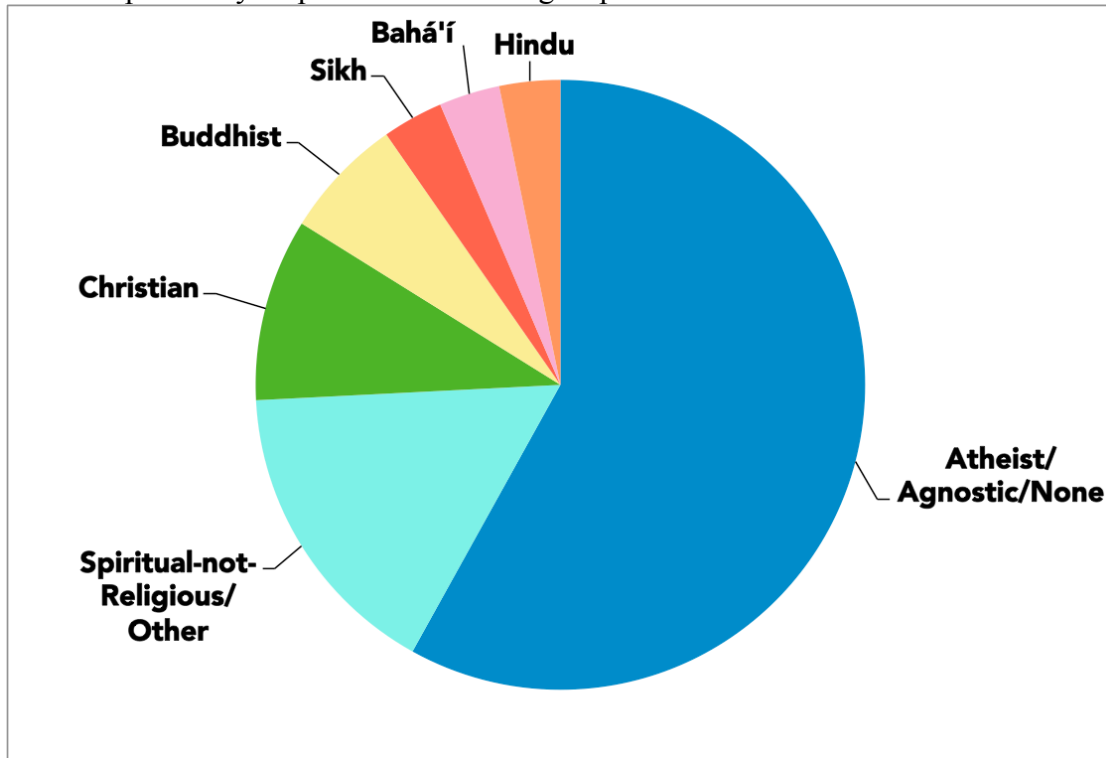


Figure 1: Religious make-up of 32 of the current Mars One candidates

specific faith. There were eight of us who identified as followers of a named religion - three Christians, two Buddhists, one Bahá'í, one Hindu and one Sikh (see Fig. 1).

While we cannot make any great claims about a sample size this small, let us suppose for the sake of argument that this is a roughly representative sample of the sort of people who will eventually go to Mars. It is somewhat less religious than the general population of Earth, but about a quarter still do subscribe to a religion, and about a third consider themselves spiritual in some sense. However, there is still a fairly wide spread of beliefs, in what will initially be a small group of people, which leads us to the first challenge that I wish to address:

The Problem of Community

Be it in a church, a mosque, a temple, or simply a family group, religion is rarely something done completely alone – worship, prayer, support and keeping each other accountable are all things that happen in religious community as well as by oneself. Religious community can also provide valuable friendship, sometimes even across demographic lines of age, race or class.

Martians-to-be of faith will be leaving behind family, their place of worship, their spiritual leaders and most other sources of religious community in their life. In a four-person crew, there might be one other who is in some way spiritually inclined, but is unlikely to share their religion. And in the early days of a Martian settlement, containing of the order of tens of people, religious community is not something that will come easily for many years.

Is religious isolation such a problem? There do exist archetypes of the isolated religious person – the hermit, the anchorite, the monastics, the wanderers in the wilderness, to name

but a few. Life on Mars will certainly be in an austere and isolated environment, with many of the luxuries of Earth inaccessible to the new migrants, and a subsistence lifestyle at first that will probably be hard and monotonous and quite mundane in nature – growing food, maintaining life support, construction. It may indeed be helpful for the faithful Martian to frame these daily tasks in a monastic context in which they are done for the spiritual development of the self and the glory of God. But the aforementioned examples are all of people who isolate themselves and live in austerity for the express purpose of religious devotion, and of closer communion with the divine – and ultimately, religious devotion is not the primary purpose of the Mars mission. As far as Mars One is concerned, the purpose of going to Mars is to establish this first settlement for the sake of future humans on Mars, and the daily tasks are for the purpose of keeping the crew alive and developing the place that they live in. And they certainly won't be isolated from other people either – they will be living and working with their crewmates full-time – just from others of their faith.

So Martians of faith will still want to take time out from everyday life on Mars to practice religion in some way or another, and they will need support in doing that.

One source of that support could be via the Internet. While the time delay of communications between Earth and Mars means that there will not be an instantaneous connection – so no watching live-streams of church services, for example – there will be satellites in orbit around Mars that allow for communication between the planets. Religion is more and more present on the Internet: sites such as Patheos³ provide blogs and centres of discussion around religious thought, local churches upload their sermons on their website and pass news around by email, Hindu temples are able to convey darshan – the moment of seeing and encounter with a deity – through images or broadcasts online⁴, and in general there is a lot of scope for religious teaching and community discussion of faith of all kinds to be stored and found online.

With that said, the act of worshipping together with others can't be wholly replicated over the Internet, and the support network one might normally receive from a religious community is something that might more naturally fall upon fellow crewmates, who know each other well and are committed to supporting and looking after one another. Given the breakdown of beliefs present in our typical sample of Martian migrants, it follows that interfaith dialogue, support and accountability is likely to become very important to extra-terrestrial religious practice. It is not necessary for specific beliefs to be shared to be available to listen or help a fellow crewmember work through religious ideas, or to worship in one's own way alongside one another. What is necessary is a degree of empathy and respect for one another, giving fellow crewmembers the freedom to follow their own conscience in how and when they should worship, and committing to help them achieve that.

One goal of creating effective and functional crews must therefore be to foster an environment in which crewmembers feel free to talk about their faith and what they believe, without the fear of being mocked or coerced into believing something different.

The Problem of Time

So, now that our faithful Martians have each other's support, how is the practice of religion itself going to adapt to extra-terrestrial conditions?

Over the short time that humanity has ventured into space, there has already been a rich history of religious ritual. On Christmas Eve of 1968, as the Apollo 8 mission orbited the Moon, astronauts Bill Anders, Jim Lovell and Frank Borman read from the book of Genesis⁵. Buzz Aldrin, on Apollo 11, took communion before walking onto the Moon with permission from his church - it was the first thing eaten and drunk on the surface of the Moon – and quoted Psalm 8 on the flight back to Earth⁶. These initial expressions of Christianity – from astronauts, supposedly emissaries for all humanity, not just Christians – were not uncontroversial at the time. But since then a couple more religions have been represented in space.

The Israeli astronaut Ilan Ramon, while a secular Jew, wanted to represent all Jews in space and thus observed Judaism while in orbit, requesting that his food be kosher and observing Shabbat⁷. Sheikh Muszaphar, a practising Muslim aboard the International Space Station, performed daily prayers from space⁸. Daily, weekly, monthly, and annual (and longer) observances are common across many different faiths, giving the linear passage of time rhythm and significance – and thus some of the practical issues associated with religious practice in space might start to become clear.

When on a space station, orbiting the Earth once every ninety minutes, how does one define Shabbat when a week passes every ten and a half hours? When should one pray to Mecca, and how can they do that when travelling at 17,000 miles per hour with the direction to Mecca changing by up to 180 degrees within a single prayer? Religious committees had to assemble and discuss these very problems so that they could advise the astronauts on how to practise their faith in the new environment of space.

Some of the world's leading rabbinic authorities agreed that Ramon could observe Shabbat using the sunset times of Cape Canaveral, the point at which he was last on Earth⁷. In the case of Islamic prayer in space, Malaysia's National Fatwa Council approved a document on how to pray on the International Space Station⁹. Like the Shabbat problem, the times of prayer are governed by the time zone the astronaut left from. Choosing a proxy point on Earth to set the times of religious observance is not peculiar to space travel and has previous precedence. For example, Muslims observing Ramadan in the Arctic Circle summer, where the sun doesn't set, have the option of using Mecca time to define the sundown hours in which they can eat¹⁰. So synchronising daily ritual to a spiritually significant place on Earth is one solution to this issue.

This works just fine for a temporary jaunt into low Earth orbit or a brief trip to the Moon, but if humans are going to spend significant amounts of time (if not the rest of their lives) in space away from Earth, or on another planet, we need to find long-term solutions that make sense and have some context for the people performing their religious duties. For example, while a default proxy time zone is sufficient for travelling through space, upon arrival somewhere with a functional day/night cycle, it might make more sense to once again adapt the timing of religious ritual to match the rhythm of the host planet. On Mars, this is reasonably easy, since a full day/night cycle lasts 24 hrs and 39 minutes. In the further future on other planets, humans might need to adapt their ritual to whatever form their day might take, which may or may not match up with a planetary day – consider Venus, whose day lasts over 116 Earth days, or Jupiter, where a day is only 9 hours.

On Mars, while it does not synchronise precisely with Earth, daily prayer and ritual, and anything that depends on sunrise or sunset is relatively straightforward to adapt to. Ritual

that depends upon the Moon is not so simple. Mars' two moons, Phobos and Deimos, take 7.6 and 30.3 hours to orbit Mars respectively. The way this interacts with Mars' spin means that Deimos slowly trudges across the sky from east to west, taking 66 hours to do so. Meanwhile, Phobos races from west to east about every ten and a half hours, meaning Deimos gets eclipsed by its brother moon about six times as it slowly makes its way across the sky. And they have phases as well, but completely unrelated to the duration of the phases of Earth's Moon. So anything that depends upon the Moon – be it deciding when Easter is each year, the lunar calendars of Judaism and Islam, or the effect of the Moon phases upon Wiccan practice – needs to be reconsidered.

Yearly calendars also become an issue – just as for days, years on another planet are completely different to Earth. A year on Mars lasts 668.5 sols, which is equivalent to 687 Earth days. Let us perform a brief thought experiment. Using the example of the Christian liturgical year (Fig. 2, top left), how could we go about creating a religious calendar for Mars?

Let's start out by taking the liturgical year from Earth at a certain point – say, the beginning of Advent, and transplanting it onto the Mars calendar, filling up the rest of the space with ordinary time (Fig. 2, top right). Now, on the one hand there are 303 extra saints days and a lot of extra lectionary space to play around with, but this doesn't make much good use of the Martian year. You'd have to wait around one and a half Earth years after Pentecost for Advent to roll around. Perhaps we could implement a different system for calculating Easter, maybe based on the movements of Phobos and Deimos, so that it falls in the other half of the Martian year to Christmas (Fig. 2, bottom left). This lends somewhat more of a balance to the year, but there's still a lot of blank space. Perhaps we could instead double the length of the seasons themselves (Fig. 2, bottom right)?

This is, of course, a particularly facetious suggestion – not least because the length of these seasons is significant in itself. For example, the forty days of Lent represent the forty days that Jesus spent fasting in the wilderness. Increasing it to eighty days breaks that symbolism (not to mention that an eighty-day fast is unlikely to go down well with the Martian Christian).

And indeed, all of these 'solutions' fail to take into account our previously mentioned problem of community. The fact of the matter is that everything celebrated in these seasons is something that the Church as a whole does around the world (with some cultural and denominational variation) together, at the same time. Trying to modify an Earth calendar to another planet's year might well be a lost cause, since Christian Martians will want to celebrate things like Christmas at the same time as their loved ones and the rest of the faithful back on Earth, regardless of what point in the Martian year it is, and the same will apply to Passover, Eid, Diwali and any other religious festival that is shared among an interplanetary religious community. Instead, it is more likely that Martians will synchronise their celebrations with Earth, and they will simply occur at different points in the Martian calendar each Martian year.

However, the years of Mars will have their own rhythm, and those who live there may still want to develop their own calendar of celebrations that gives their own year a structure and narrative. This is even more pertinent for the eventual next generations of humans on Mars, the children born there, for whom the cycle of an Earth year is only relevant because the rest of humanity observes it. The new Martians will increasingly need and thus create festivals

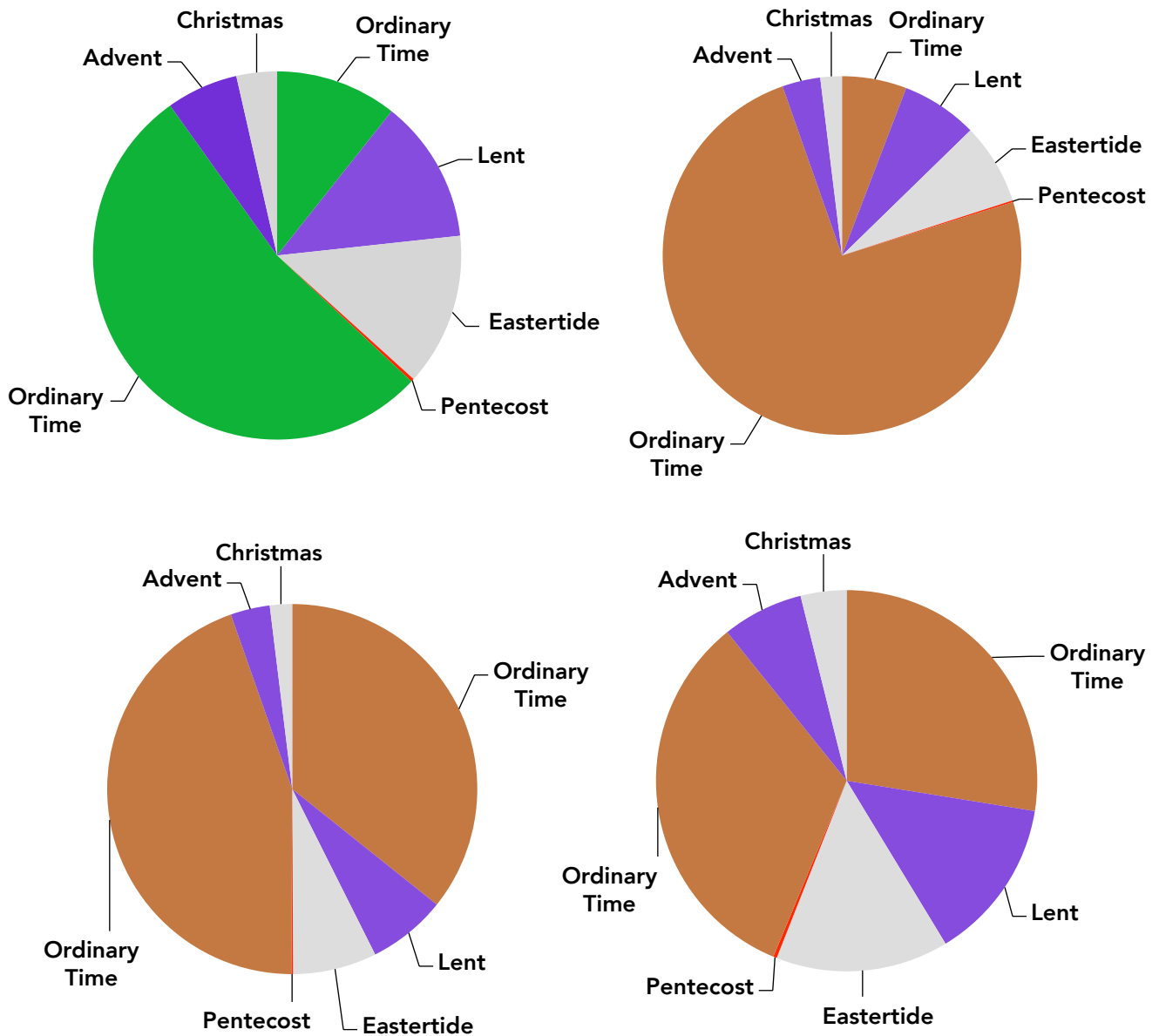


Figure 2: A typical Christian liturgical year on Earth, lasting 365 days (top left), and three not-so-successful Martian liturgical years, each lasting 668 sols.

that belong to them, and that fit into their own rhythm of life. So perhaps we will see a Martian calendar grow organically over the top of Earth festivals that occur sporadically over the Martian year.

For example, there may be a Martian New Year celebration, perhaps coinciding with the Martian anniversary of the first human landing. Mars has its own Solstices and Equinoxes as well, that mark out the seasons. Every three or so Martian years, a Martian dust storm becomes so big it envelops the entire planet for weeks – that in itself is a significant event, one that is accompanied by austerity and conservation of energy for its duration. Perhaps that too will become a kind of mobile festival, with weeks of fasting during the storm, followed by celebration of its passing.

It is clear that on Mars and in space, we are forced to re-examine what times are important and sacred, and whether they still make sense when removed from the context of Earth. We

can also wonder whether sacred things can be found on other planets that don't have an equivalent on Earth.

The Problem of Space

The geocentric model of the universe began to be challenged and eventually superseded in the 16th century and beyond, to be replaced by heliocentrism at first, and then by larger and larger understandings of the Universe the further we were able to see. In the early 20th century we discovered that our galaxy is only one island in the vast ocean of the Universe, and in its latter half we settled on an age of the universe in the region of 13 billion years.

In the realm of science, humanity left Earth-centrism behind a long time ago. In the sphere of religion, however, Earth is often still the centre of the Universe, metaphorically speaking. This is for good reason – religion has always been about humans and how they relate to each other, the world around them, and the divine. With humans limited to one planet, it is only natural that the scope of religion, though it may acknowledge the existence of the outside Universe, is limited to one planet as well. Despite many varieties of musings over the years, exactly what goes on in the heavens has never been entirely relevant to the spiritual well-being of humanity – until now.

Here we start a long process of detangling what is important in a religion from the Earth-centric baggage it has developed over its existence – and viewed from outside of Earth, some of it becomes harder to make sense of. One particularly illustrative example of this is the fundamentalist pre-millennial tribulation Christian narrative of the end times, as popularised by the *Left Behind* books: first there is a Rapture, where all the Christians are taken up to be with God. Will this happen on Mars as well? (If so, three Martians just vanished.) And then there will be the Tribulation: seven years of famine, natural disaster, war, the rise of an Antichrist, the establishment of a tyrannical economical system, false religion and more. What about the people on Mars? Are they watching from a distance, shaking their heads in sympathy? Are they happily enjoying post-capitalist freedom while the number of the Beast wreaks havoc back on Earth? Or will they be subject to their own disasters – apocalyptic dust storms, asteroid collisions, or attack by alien locust demons? And when Jesus finally returns to reign on Earth, will He rule over Mars as well? Will Mars get state visits by spaceship? Or is space utterly irrelevant to a population dwelling for the rest of eternity inside the restored holy city? Reorienting the perspective of such a narrative to Mars opens up a lot of questions.

While such speculation can be entertaining, it is true that all current places of spiritual significance are on Earth – and even for someone who believes that one can encounter God or the divine anywhere, there are still some places which might be considered particularly spiritual, such as shrines, temples, cathedrals, or places in nature where one feels especially connected to God. All of these are on Earth.

Except for one, and that is the 'overview effect', found in Earth orbit^{11,12}. The shift in perspective triggered by personally viewing the Earth from above has been described as something akin to a religious experience by a number of astronauts, and often has a completely transformative effect on those who experience it. The experience is a profound revelation of the fragility and finite nature of Earth, and a powerful sense of a connected world that does not truly possess the borders humanity imposes upon it¹³. Astronauts routinely return to Earth significantly affected by it, and the pictures astronauts have brought

with them have had a similarly transformative effect on humanity as a whole. Our understanding of Earth as our one home, the planet we all live on, underwent a paradigm shift catalysed by images such as Earthrise (Fig. 3), captured by astronaut Bill Anders in 1968, with effects such as catalysing the rise of the environmentalist movement¹⁴. In a way, humanity itself experienced something akin to a spiritual awakening, and would never see the world in the same way again. Perhaps there is a similarly transformative value to humanity of settling Mars, and of exploring even deeper into the Universe.



Figure 3: ‘Earthrise’, taken by astronaut William Anders, 24 December 1968.

Aside from the overview effect, the places and spaces in which people hope to encounter the divine are still right now all on Earth. Sites of pilgrimages, holy cities, sacred rivers – none of them exist beyond this planet. For the faithful living on Mars, it may be that Earth itself becomes a site of pilgrimage for those who spend most of their lives living beyond it. This would be a deeply costly endeavour, especially in the early stages of Martian migration, which may be completely inaccessible to most worshippers. Or it may be that the physical places of Earth by sheer necessity fade in importance, and new places on Mars emerge as spiritually significant locations, perhaps even intentionally blessed to provide the same encounter with the divine that is provided back on Earth.

A Martian Faith

Regardless of religion, Mars will develop its own myth and folklore, as its own places, spaces and phenomena become significant to the people who live there. One good exploration of this idea in fiction is in Kim Stanley Robinson’s Mars trilogy, in which he suggests a number of mythical beings that enter the cultural consciousness of those who

settle, live and grow up on Mars and populate new folk tales for a new planet. There was Big Man, the primordial resident of Mars whose discarded belongings made up the landscape – a personification of the massiveness of the Martian geology due to its low gravity. There was Paul Bunyan and his blue ox, the lumberjack folk figure of the American frontier repurposed for the Martian frontier, an intrepid explorer who was the trickster god to the Big Man’s ice giant, who challenged and defeated the Big Man with cunning and made a home for himself on Mars. There were the little red men, who sometimes you saw out of the corner of your eye or whispered in your ears while you slept, the remnants of the original Martian population that were never discovered, but still remained in our minds, cultural memories of the days we believed there might be intelligent life on Mars.

That is just one fictional exploration of what might become culturally significant on Mars in the future. Just for fun, I’ve done my own exploration based around cultural reference points we might take with us were a mission to launch today. Our precursor figures might include David Bowie – a cultural icon who became associated with space, aliens and the question of ‘Life On Mars?’, who left Earth behind but perhaps can still be found living hermit-like just over the horizon. Or Mark Watney from Andy Weir’s *The Martian*, the man who survived the worst that Mars could throw at him and remains as an encourager figure to those who seek to do the same, offering useful if irreverent advice to anyone caught in a sticky situation.

The landing sites and rovers on Mars, our robotic forebears who made our own journey possible may also play a large role. We often like to personify space missions, and the Spirit, Opportunity, and Curiosity rovers are all intrepid explorers themselves, named for the qualities that drive us to discover new worlds, who slowly and patiently journeyed across the face of Mars, singing to themselves as they waited for humans to join them. They might get their own pilgrims and visitors in the future, perhaps in search of making some sort of spiritual connection with those qualities the rovers represent. The peak of Olympus Mons may become a site of transcendence, which unlike its Mount Olympus counterpart on Earth, reaches 16 miles into space – not quite beyond the Martian atmosphere but truly as close as you’ll get in this solar system to a mountain that pierces the heavens.

This is, of course, all speculation and guesswork, and only time will tell as to exactly how faith develops on a new planet. As festival and ritual adapt, what fundamentals are retained on the journey to Mars and deep space, and what is left on Earth as local tradition? What new traditions will take their place?

As for me, a person of faith hoping to make that journey for myself one day, for now I choose to consider the change of perspective I may receive from the act of changing a single word: “Your kingdom come, Your will be done, on Mars as it is in heaven.”

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