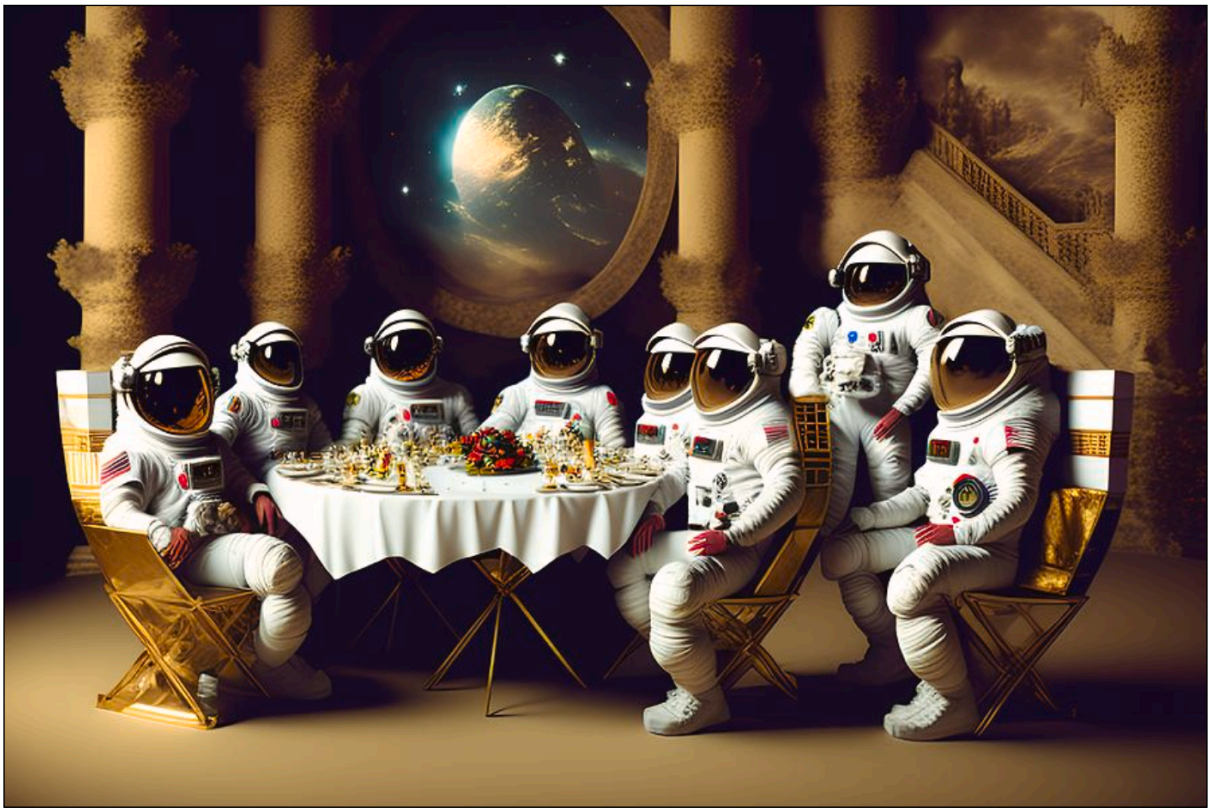

To Boldly Stay

There is no Planet B.
Rob Newman, 2006

IN SEPTEMBER 1991, AN 8-PERSON team was sealed inside a $150 million, 3.14-acre research facility in Arizona optimistically branded 'Biosphere 2.'

The ambitious scientific experiment was designed (depending on who was promoting it) to either demonstrate the feasibility of colonizing other habitable planets, or of living indefinitely inside a self-contained, post-Apocalyptic doomsday bunker.

The first planned two-year mission ended with the crew losing up to one-sixth of their body weight: Despite the structure being the largest closed ecological system ever built, the seven artificial 'biozones' couldn't produce enough oxygen, water, or food for even eight people, and as a result, they spent most of their time simply trying to survive.

A second, abbreviated mission collapsed after less than a month in interpersonal conflicts and psychological problems. (Put simply, the crew drove each other crazy.)

Tellingly, while hailing the experiment as a success, when they were asked afterward what was the most valuable lesson they had learned from it, the crew's reply was unanimous: "Everything is connected."

As indeed, it is: plants, air, water, soil, animals, and microbes are all intricately, inextricably interdependent. And as complex lifeforms, humans have complex needs, and are entirely dependent on Earth's millions of other lifeforms for their air, water, and food.

The scientific evidence increasingly points to a sobering fact: The only planet that can dependably support humans is the one they evolved on and are thus perfectly adapted to … In other words, 'Biosphere 1.'

The best candidate for mankind's first planetary space colony is, of course, Mars. Unfortunately, despite being the most hospitable destination in our solar system apart from the Moon (to an astronomer, Mars is Earth's identical twin), everything about Mars seems designed to kill us.

The surface pressure on Mars is less than 1% that of Earth. The dust-laden air is mostly CO^2 and the temperature ranges from a balmy 30^0C (86^0F) in Martian summer to a bone-chilling -140^0C (-220^0F) in winter.

Martian air is saturated with toxic chemicals called perchlorates, and any sparse water is buried a mile below the surface. The thin atmosphere offers little protection from intense solar radiation and cosmic rays, which damage human DNA.

The challenges of getting to Mars safely in the first place are plentiful, the most difficult (aside the everpresent radiation and the hazards of orbital space debris) being zero gravity. Human bones, muscles, and organs are all designed by nature to function within a very narrow range of force pulling them in the general direction of down.

Artificial gravity could fix this, but it would require huge structures, probably miles across, with no practical way to build them in—or transport them to—space.

Apart from causing muscle and bone loss and damaging human DNA, space-flight changes the microbiome, disrupts circadian rhythms, impairs vision, increases the risk of cancer, inhibits the immune system, and weakens the heart, among other known (and no doubt many as yet unknown) pathologies.

As demonstrated by Biosphere 2, lengthy isolation and confinement also results in poor emotional regulation, increased stress, anxiety and depression, sleep disturbances, and decreased cognitive and motor function.

It might make more sense to confine our colonization of space—at least initially—to sophisticated robots, AI-enabled machines, and perhaps in the future, cyborgs. (Rather than trying to make other planets habitable, it might be easier to design humans to make them more conducive to existing conditions.)

The astronomical cost of colonizing space also begs the question: Couldn't that money be better spent addressing our many current, rapidly multiplying problems here on Earth?

To combat climate change, for example, will require huge technological breakthroughs, which will only be possible if we devote all our resources and talent to it, rather than squander it trying to recreate an artificially similar climate on another planet.

The rush to colonize space also creates a grave moral hazard, since it leads many to believe that if we fail in our efforts to save our home planet's environment, there is always the 'Plan B' of going elsewhere.

Much of Earth still remains unexplored, especially the oceans, and if our spacefaring goal is to meet extraterrestrials, we need only look to cetaceans and whales, which, ironically, we seem determined to eliminate before we even know much about them.

Lastly, the rush to militarize space—as well as the nearly ubiquitous depiction in the mass media of aliens as hostile and space as just another battleground—strongly suggests that we will only take our species' worst tendencies with us to other worlds.

It might be both wise and brave for us to slow down our headlong rush into space, perhaps even to wait until we have become more mature as a species, our adolescent moral sensibilities one day caught up to our vast intellectual and technological prowess.

Maybe the greatest adventure of all would be—at least for now—to boldly stay. ■