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Dave McMahon: Going to Mars is great; just don't take humans along

By Dave McMahon

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The incentive to write this came from an article on Friday, August 26, 2016, about tests of the “splashdown” of the capsule for NASA’s plan to put humans on Mars, and an earlier article on the space shuttle.



NASA photo

This 1999 photo, called “Twin Peaks” by NASA, is from the Mars Pathfinder mission.

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The space shuttle was, and the journey to Mars is, a day dream appealing enough to inspire public support, but wildly impractical and, in large part for that reason, an incredibly expensive endeavor.

Lest the reader suspects me of bias, let me say that I am in favor of some kinds of space exploration, though some of the savings that would result from the choice of more practical rover missions would be better spent on things like, say, opiate treatment programs.

And I do not criticize those who worked or will work on these projects doing their best to achieve engineering marvels; it is the impractical ideas sold to us that are flawed.

Lets start with the space shuttle program, the first wildly impractical idea. It was a nice daydream to reuse an airplane-like vehicle to get quickly and easily to and from outer space. However, the criticisms of the idea voiced from the start by the New Republic magazine and others have turned out to be true.

The limiting factor on what can be lifted into orbit is the maximum weight that the rocket engines can lift to a speed fast enough that the centrifugal force of the orbit exceeds the pull of gravity. Wings do not help enough with that on the way up. The goal is speed more than altitude, and wings just add a little drag and inefficient vertical lift. And wings and landing gear and the internal structure to keep the vehicle from breaking apart on touchdown add weight and lots of it, and so the trade-off is that the payload is greatly reduced.

Also, in order to make the shuttle work, it turned out that not only was the space shuttle vehicle itself needed, but two external solid rocket boosters, and a huge external tank to feed all of the liquid rocket engines in the shuttle vehicle. The result is lots of complexity. Complexity is the bane of reliability in engineering. So the space shuttles were not reliable. It is a sad but necessary point that five space shuttles were built, but two fell to earth losing lives in the process.

NASA itself has figured all this out now. The article says, “Splashdowns [of capsules rather than the use of winged reentry vehicles] are back because they require fewer instruments than returning to land, and more space can be dedicated to supplies and equipment.” However, to get NASA to come around it may have taken the realization that

we are now so far behind on developing practical rocketry that we are having to pay Russia \$70 million per seat for transportation to the International Space Station using Russian Soyuz spacecraft (and don't get me started on the International Space Station).

That brings us to the journey to Mars.

We have already sent two rovers to Mars and they are doing fine work operating the tools for science experiments loaded on the rovers. Advances in robotics and drone technology can only make future rovers better. Sending humans to operate the tools for the experiments is wildly impractical. The science tools are still needed and a lot fewer science tools will be sent because of the weight of the resources needed to support the humans.

Humans have to be supplied with oxygen and water, and they have to be fed. This has to be done not only on the way to Mars, but while they are there and then on the way back. And since we value human lives more than mechanical devices, you have to give them backup systems or at least incredibly robust systems for everything.

Oh yeah, and a vehicle with a rocket engine and fuel to get back out of Mars' gravity to splashdown back on earth would also need to be sent.

(For those who have volunteered to go on one-way missions and be left there to die, it would be much cheaper to provide them with therapy.)

All these are added enormous weight burdens to lift not only into earth orbit, but to escape earth's gravity and journey to Mars, and then back.

And, think about it, will the couple/few humans walking around Mars really experience Mars? No. They will be in space suits that will isolate the humans from the feel and sound of what Martian wind there is, and they will be protected from the temperature extremes that they really will not be able to feel and still live. If we are bound and determined to make Mars our next mission, lets send a rover with an IMAX format HD

camera and some sensitive microphones. That way we can all see and feel and hear it. And maybe have a contest for scientists or even a lottery for ordinary citizens to operate the rover from earth with a joystick.

This would give a lot more earthlings the experience of being on Mars with the same fidelity as a few humans having virtually the same experience from inside their space suits at an enormously higher risk and extraordinarily higher price with fewer science tools on hand.



If you are not yet convinced that sending humans to Mars is folly, read “Packing for Mars: The Curious Science of Life in the Void” by Mary Roach. She was given seemingly unlimited access to NASA’s journey to Mars program.

The author never says the idea is folly — perhaps, understandably, a spoken or unspoken condition of her access. But the only conclusion that can be drawn from her review of the various aspects of the journey is that it is wildly impractical. It is not just the physics and science of the journey that is the problem.

The author talked to former astronauts who were selected for previous missions as having the right personality for the trip and who were trained vigorously. Those astronauts, giving examples from moon missions, conclude that two or three humans in isolated tight spaces in outer space for months on end would not be able to tolerate each other long enough to satisfactorily perform a mission to Mars and back.

According to a CBS article, NASA's human exploration program accounts for half, \$8.51 billion of its budget request. That figure also includes a visit to an asteroid (same arguments in opposition) and some new International Space Station vehicle funding that NASA says is also critical to the journey to Mars. (Only about 10.5% of NASA's budget is being spent on Earth science.)

Surely with the money now being spent on the journey to Mars we could treat a lot of opiate addicts and still have money left to send more rovers to other places — to see if there is life in the sea which astronomers think lies under the ice on the surface of Europa, a moon of Jupiter with an oxygen atmosphere. Or, as pointed out in one of the earlier articles that inspired this piece — to do as good a job mapping the ocean floor of planet Earth as we have already done mapping the surface of Mars.

Dave McMahon is a Charleston lawyer.

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2	Gonzaga (6)	4
3	Kansas	1