



[An online publication of the Milwaukee Lunar Reclamation Society,
a chapter of the National Space Society & of the Moon Society
& an Outpost of the Mars Society]

OUTBOUND #24 DECEMBER 2019

Note: all the “Mars-focused issues” of 30 years of Moon Miners
Manifesto are now online in one theme-focused issue:

<https://space.nss.org/media/Moon-Miners-Manifesto-Mars.pdf>



[Is your rooftop ready?](#)

The MMM link above does not include articles in Outbound, a no set page limit web-publication, in pdf form only, introduced after we had stopped publication of Moon Miners' Manifesto with MMM #300, 30 years!

What would you like for Christmas (other than a sack of bucks) ??

What space projects would you like NASA to promote and Congress to fund?

√ A return to the Moon, to fascinating places where no one has gone before?



√ A permanent outpost on the Moon? Where on the Moon?

√ *Hotels at both E & W limbs where the full glory of the Milky Way is visible?*

√ *A position on each Space Station crew for someone winning a lottery and passing all the physical tests, and with talents needed on each crew?*

√ *a Position on the first crew to visit Mars and with needed or useful talents?*

√ *The first person allowed to stay on Mars, as the first Martian, but on your own after all your food and other supplies have run out (LOL!). ###*

PROJECTS FOR THE NEAR FUTURE:

•A FIRST HOTEL IN EARTH ORBIT

√ how financed: *lotteries? Prizes for _____?*

√ *what latitudes? From arctic to antarctic circles?*

√ what altitude?

√ nightside city lights

√ live interview, questions and answers

√ *lotteries for who gets to talk with him/her/them on board*

√ *income from tourists to pay for more features desired by crews*

√ *One torus rotating alternately at Moon gravity speed and Mars gravity speed, for length of time depending on income of those wanting Mars, or Moon gravities*

Projects here on Earth:

√ *Learning how to design, create, and sustain Living Walls.*

√ *Contests for adults, and for teenagers; uses of Living Walls in Earth Homes designed with windows facing sunlight part of the day, or from dawn to dusk by rotating mirrors*

√ *Showcase homes incorporating Living Walls or Vertical Vegetable Gardens*

•LUNAR & MARTIAN HOME INTERIORS for tourists in basalt rich areas: Idaho, Oregon, Washington, California, Utah etc. etc.

Furniture and furnishings made of cast, carved, and/or fiber basalt and with showcases in key cities (those already involved in NASA programs?) or in other cities. (in between?)

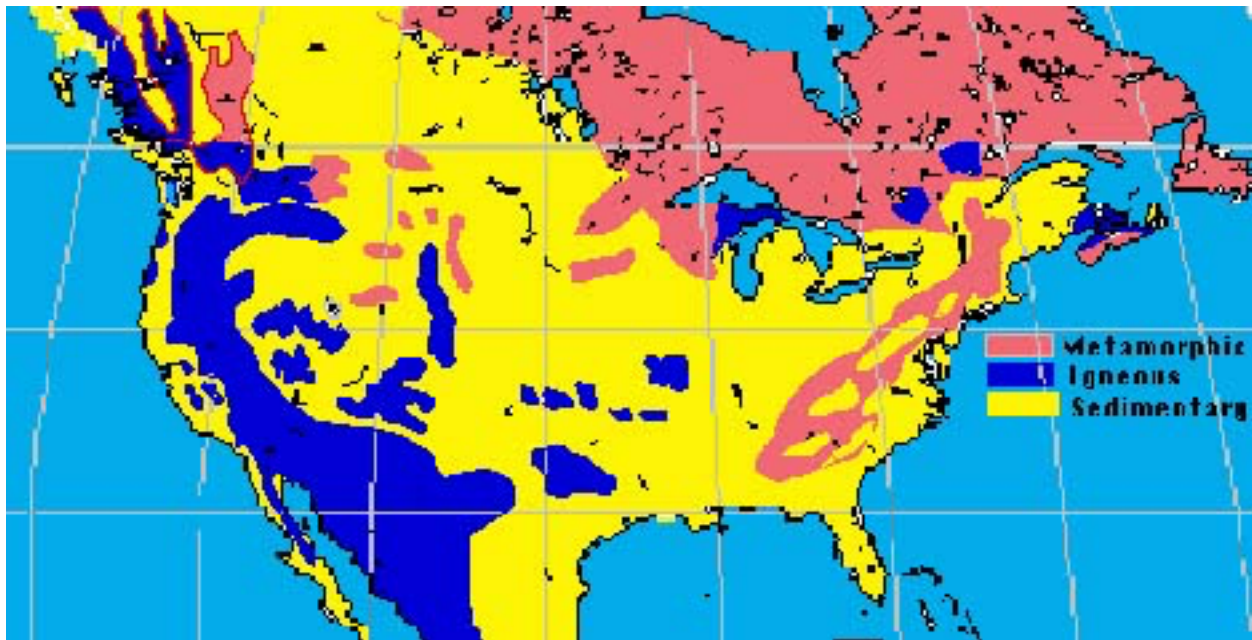
**Basalt: √ cast, √ carved, and √ fiber
will be “the √ iron, √ wood, and √ cotton”
of the Lunar and Martian Frontiers**

**It is vital to show the public that on both the Moon and Mars
we will have resources to meet most of our material needs.**

Below: a map of North America:

Blue areas are “igneous” or basaltic areas of North America

Including (to my surprise) in Michigan’s Upper Peninsula and NE Wisconsin - my personal “summer cottage home turf” for many decades (no more)



Notice that the Rocky Mountains in the West are basaltic but that the Appalachians in the East are not.

Where to buy samples of basalt rebar and basalt fiber fabrics

[https://www.basalt.guru/shop/product/basalt-rebar-sample-pack./](https://www.basalt.guru/shop/product/basalt-rebar-sample-pack/)

Prices c. \$12 for each rebar and/or fiber sample

Note: One great feature of basalt fabrics: they can't burn! I've tried! (PK)

Revisiting the Dual Torus Space Hotel Concept

INSTEAD of a Dual Torus Hotel in Earth Orbit, the inner torus with Moon level gravity, the outer torus with Mars level gravity, a single torus could simply change its rotation speed between Moon level gravity and Mars level gravity.

(This penny-pinching option, may be difficult to arrange, and is not the ideal choice.)

This could be done by rocket engines on the outside of the torus, that could be pointed in the direction of the facility to speed it up (to simulate Martian gravity), and pointed in the opposite direction, to slow it down (to simulate lunar gravity.)

This could **cost significantly less than half as much** and would change its rotation speed to suit those wanting to feel what it would be like first on the Moon, and then on Mars, or visa versa, **at a significantly lower cost and ticket price.**

As in the original Dual Level Torus, *their cabins, with furniture and furnishings could all be made of cast, carved, or fiber basalt.* And the hallways connecting them could be lined with *Living Walls*, in differing designs, and with differing sets of plants, and differing arrangements as one walks along.

And there would be classes on how to create “living walls” aka “vertical gardens,” how to pick plants, and how to fasten them to a grid, and how to maintain them with the right amount of “grow lamps,” “seasonal temperature swings,” and other features. *There would also be an area in which basalt furniture and furnishings could be shown in many styles.*

Costs and prices could be much lower this way, attracting more “would be” Moon and Mars “settlers” and “supporters” as well as media reporters. But this means that all “would-be settlers” would spend time in both a slower Lunar Gravity session and in a faster Mars Gravity session.

While the Dual Torus program would be the more ideal, its higher cost would likely cause delaying the time would-be Moon and Mars settlers could spend time on such a facility, thereby delaying the date settlements on Mars might be established. ##

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**Among the first settlers of the Moon and Mars
where and when the number of brains and hands
is more important than muscles,
a “ton” of “midgets” might accomplish more
than a “ton” of people of more “normal” weight and size.**

“More to Mars” by Peter Kokh

***Sending 12 men to Mars for the price of 4, or 24 for the price of 8 - A Radical
First Exploration Mission Plan that Should Not be So Lightly Dismissed***

Some years ago Robert Zubrin first showed us how to get much more Mars mission for our buck, in his “Mars Direct” mission plan proposal. We could make the fuel for the Earth-return leg on Mars itself. In contrast, bringing that fuel along with us to Mars would either mean much heavier and more expensive ships, or less equipment to use on Mars, or both.

Now it is time to show that there is a Mars Direct “compatible” mission plan option that could double or triple of the size of the crew - virtually for free - resulting in

a first Mars exploration mission with two to three times as much productivity. We call this the **“More to Mars” mission architecture.**

All previous Mars mission plans assume without examination that crew personnel would be selected according to established NASA standards in all respects. Built into these standards is a self-hidden visceral chauvinism that does not let us examine other options, nor even suspect that other options exist. But in looking a better way to do Mars, this hidden parameter deserves as much attention as any other.

Five years ago, in MMM # 64 April ‘93 in our annual “World Watch” by AFD* News Service (* April Fools Day), we ran the following “new story”

BOULDER, COLORADO: Pygmies and Dwarfs should crew our first exploratory missions to Mars say Doctors Erin Keebler and Tung Yhn Tshieq of the Willy Ley Institute in a report to the National Space Council which they will present at next month’s Case For Mars V Conference in Boulder, CO.

Pygmies and Dwarfs, or Little People as they are now more commonly called, have greatly diminished body mass but fully normal brain size and intelligence.

The Mars Mission, they say, *can easily be engineered so that brains count for almost everything, brawn for next to nothing. A crew with a combined body mass 25% that of the average astronaut crew of the same number would have a tremendous advantage in two ways.*

First *the crew would need only a weight-proportionate amount of consumables: food, water, fresh air reserves.*

Second, *while the mass and volume of needed spaceship systems and work stations would remain unchanged, the size, volume, and associated mass of both private and common quarters and walk space could be proportionately reduced.* Keebler and Tshieq contend that for otherwise *identical missions, one crewed by Little People and designed to be so, would have a fueled launch weight 40% less than one planned for full-size crew members.*

These savings can either be reflected in a cheaper, quicker mission, or “*cashed in*” for extra payload and a longer duration stay on Mars, or for a larger crew. This becomes an attractive win-win-win situation. *The only drawback, the authors admit, is the need to sell the idea to a public that has not ever really accepted either Pygmies or Little People as real people.*

For individual space supporters, the vicarious pleasure of identifying with our pioneers and explorers is a big element and the choice of so ‘unrepresentative’ a crew could demand an overdue attitude shift. **AFD News Service [April fools Day]**

In fact, we were dead serious about this proposal.

Yet the disheartening lack of subsequent feedback to this piece only served to show how *most readers apparently took it as a joke. Yes, a sad joke on them (on you, if the shoe fits!)* The hint not taken five years ago, it is now time to declare ownership of this idea and to publish it anew. *This is one of those times, dear reader, to either lead, follow, or get out of the way.*

As pointed out in our “tongue-in-cheek” AFD story, the substantial weight savings from selecting substantially smaller humans of undiminished capacities and abilities can be “spent” in three ways:

- **Less massive Mars ships, same size crew mission**
- **Same size ships, more consumables, longer stay**
- **Same size ships, larger crew, larger task load**

If the cost of the first Mars mission is a major political stumbling block, the same size “ground mission” can be achieved with a smaller rocket and less fuel - at substantial cost savings.

If the government(s) has (have) accepted conventional costing, what we get for that price can be doubled or tripled by either remaining option.

The objections sure to arise to such a plan are the following, neither of them defensible:

- “Subsize humans have inferior intellects and lesser technical and manual abilities.”
- “The public will never identify with these “toy” sized humans and thus lose interest.”

The first objection is truly facetious. There is plenty of time before the first Mars mission (20 years or more) to identify and select young dwarf and/or Pygmy individuals with the sufficient aptitude, and then to educate and train them from early youth to perform as outstandingly as any more advantaged candidates.

The second objection is reminiscent of racist objections to the introduction of blacks into the major sports. Sports history in the past half century gives this thesis the lie. *The public willingly and very quickly takes to its heart whoever performs in outstanding fashion.* We would sell the public short, perhaps to disguise hidden unexamined attitudes in ourselves.

I am not suggesting here that Mars be settled exclusively with individuals of diminutive size, only that ***making our initial exploration crew selection from their ranks could be the smartest thing we could do.***

In time, improved transportation options will make emigration to Mars affordable to individuals of more commonplace stature and body mass. ***“The” important thing, however, is to break the ice on Mars, and to do as much pioneer scouting and pave-the-way scientific investigation as possible in one shot given the money available, so as to lead to the opening of the Mars Frontier in the timeliest fashion possible.***

Yes, this would be a bold tactic in casting the 1st Mars Crew

The “obvious choice” is to pick a crew of healthy males representative of participating nations. ***There could hardly be a more striking instance of the obvious tactic being “dead wrong.”***

Every aspect of the Mars mission can be designed so that brains are everything, brawn irrelevant. We can send more “Little People” with the same supplies and thus accomplish much more mission for our precious bucks. ***“More to Mars” is our best chance to make the most of what may be a once only opportunity.***

Could prejudice ruin our one best chance?

The purse-holders of the world may not pay for a “second Mars Exploration Mission,” whether or not additional missions have been planned as part of a total exploration package.

The one thing that is vitally important is to accomplish all the exploratory and investigative tasks necessary to pave the way for the opening of the Mars Frontier to settlement in the first mission, lest we get no follow up opportunities.

Whoever thinks that this is not important, has learned nothing from the politics of Apollo. ***If we do get the chance to send humans to Mars, it may very well be a solitary chance. “More to Mars” is our best chance to make the most of it.***

I urge the prospace and pro-Mars communities to take the suggestion as seriously as it is meant, and to constructively brainstorm it further. “More to Mars” is a second watershed in the history of Mars Mission Planning. In the end, through our decisions, we shall deserve what we shall get - as always.

In the process, educated and talented Little People and/or Pygmies could earn lasting and long overdue respect. ***Just as their outstanding participation in the***

performing arts and major sports has won African-Americans widespread and genuine, if limited respect in today's world, a successful mission to Mars crewed by diminutive persons will do much to erode the major cultural barriers that these populations now face.

In the end, we must ask ourselves that age-old question:

“Is it better to be on top of a small hill, or half way up a tall mountain?”

In becoming all that man can be, it is vital that we employ all the varied talents at our disposal. *Every time we collectively exclude full participation by a minority population, we self-betrayingly choose “the smaller hill.”*

Dwarfism may be one of humanity's infrequent and most unsuspected talents. A successful one-shot Mars-opening mission lies in the balance.

Three or more millions of years ago 3 foot tall proto-hominids scouted the way for the human rise to ascendancy on our home planet. Does it not seem poetically fitting that a “race” of little scouts turn the trick once again - this time on Mars?

NOTE: When African Americans were first allowed to participate in Major League Sports - basketball, football, baseball - many people were upset - until their performance put many of them at the top, and made all three sports - football, baseball, and basketball - that much more exciting to watch.

If, and that is a big “IF,” “**humans of lesser stature**” are allowed to participate in the opening of Mars, and their productivity is high, *advancing the date when Mars will be another human world*, their achievements may change public ideas of how much “little humans” can do, and elevate their public status to a level with everyone else.

It might be wise to “introduce” little people in Moon settlements first. <PK>

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“Canals” vs. “Chanel’s”

Every Spring, the thick sheet or layer of frozen Carbon Dioxide melts exposing a smaller sheet of ice, which then too begins to melt. While these ices are in the liquid state, they move away from the Pole (North or South) flowing in channels, until they too evaporate, only to reliquify, then refreeze at the opposite pole.

How much water ice are we talking about? We can make an estimate, which may be close to accurate or way off target,

Could we gather this freshly liquefied water and use it in our settlements? Yes, but what we capture, will mean that much less ice will form at the opposite pole. The fact is there is only so much water ice on Mars, and we must use it in a manner that it will be 100% recycled. That's quite a challenge, but there is no way around it. On Earth, we use water as if the source is infinite.

We have to use water as if that's all we have, because in truth, it IS all we have.

The hard fact is that there is only so much water ice on Mars, and even if we tap it and use it carefully, we will in time, find our water reserves evaporate or sink into the ground. **When it comes to comparing future human civilization on Mars with our civilization on Earth, the need to capture, cleanse, and reuse ALL used water is absolute. In comparing our civilization on Earth with that someday on Mars, this handling of used water as if that's all there is, will be a dominant factor, simply because *THERE WILL BE "ALL THERE IS."***

Indeed, applications for becoming a settler on Mars, will not be accepted for anyone who has not lived in an environment where ALL water, no matter with what kind of waste, MUST be recycled! ***If applicants have spent time on either the Moon level or the Mars level (or both) of our proposed Dual Torus Facility in Earth Orbit, they will have learned how to reuse water, because on that facility, "all there is, IS all there is."*** **PERIOD!**

Back to Water on Mars

We have found two glaciers below the surface, one in the northern basin of Ultima planum (basin) and the other in Mars deepest basin, Hellas planum. The amount will put a limit on population tapping those reserves. ***On Earth, where we have an enormous global ocean of considerable depth plus arctic and antarctic ice, we are used to seeing our urban areas grow and grow and grow. That won't (& can't) be the case on Mars.***

Will we find ice at the top of Mars great volcanoes? Or beneath the lowest areas of Valles Marineris, Mars' enormous 3,000 mile long SUPER Canyon, so vast that in comparison, Arizona's Grand Canyon is just a "ditch." The answer is most likely "YES," as this vast canyon eventually opens into a clear equally massive delta into the vast Northern Basin. But the amount of ice is still limited.

Just as on the Moon, settlements on Mars will have to recycle used water religiously, because that is all there is, and that puts a "cap" on settlement. But the more completely we recycle ALL the water we use, the more secure will be our presence on Mars.

One useful habit would be to separate used water into categories of waste. ✓ Used water from a factory, or ✓ from farming, or ✓ from human wastes, ✓ etc.

In general, we do NOT do this now. *Waste water from “doing dishes” and various types of manufacturing, and from watering farm plants etc. should all be separated. Right now, we could be described as a “monotreme” Society.*

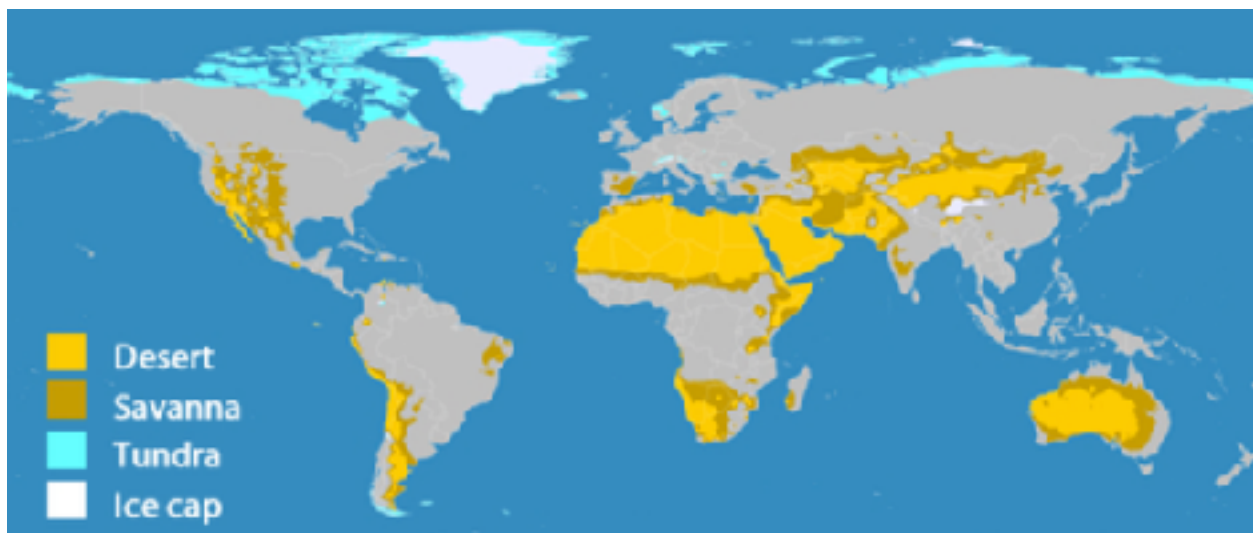
We should look at various waste water systems and water treatment plants, and find out which systems do the best. In the process, we need to look at the best methods of separating different spoilants, and if we could put various spoilage to good use.

Both the Moon and Mars are “Desert Worlds” and most of us do not come from desert nations. Our “token” uses of used water involve habits and systems we must leave behind if we want to settle the Moon and Mars.

An ideal place to learn how to best handle and reuse human waste water.

If indeed we build a Double Torus “hotel” in orbit around Earth where people interested in settling the Moon and/or Mars can best get a feel of what it would be like, then we should include human waste systems of various types, from the usage of which we might learn what works best. After all, this facility has a limited supply of water and must reuse what it has over and over and over again.

This facility could have a number of “candidate” waste water reclaiming systems, to teach us what works best, and how do improve “current waste systems” on board.



A MAP of DESERT AREAS AROUND THE WORLD

We should study how people in these areas carefully use what water they have and how they cleanse used and waste water and reuse it over and over again. ##

What world in our Solar System has the best views of the “heavens?”

That’s easy. The Moon, from 2 points of view.

The Moon’s **Nearside** ever changing view of Planet Earth
continents and oceans in daytime, city lights during nighttime
The Moon’s **Farside** spectacular view of our galaxy, the Milky Way

Further out

The view of Jupiter from Europa

(It’s way too hot on the inner moon Io, to enjoy a closeup view of Jupiter)

The view of Saturn and its rings from its moon Iapetus

(Iapetus’ orbit is inclined 15° to Saturn’s rings)

**Further out yet, Pluto’s view of its companion, Charon
and Charon’s view of its companion, Pluto**

(Both worlds keep the same face to the other,
with opposite day/night views)

Whoa! What about Mercury’s view of the Sun?

(Maybe, but you had better wear some very thick sun glasses!!
And keep your body in the shade)

Where on Earth do we get the best views of the heavens?

Anywhere hundreds of miles from city lights,
and when the skies are clear of clouds,
the higher your altitude, the better,
from on top of a desert mountain
e.g. in Chile’s Antofogasta Desert

If travel expenses are not a problem,
from Antarctica’s Dry Valleys
in local nightspan (6 months long)
hundreds of miles from the closest city
(The United States’ McMurdo Sound Base) ##