

“The Big Moon Dig”

[The Big Moon Dig](#)

A Short Story by Tom Riley

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Edits

Words 5116

In Space, sometimes you must go forth alone; but sometimes you must go forward as a team -- no matter what it costs.

~~~ Short Story ~~~

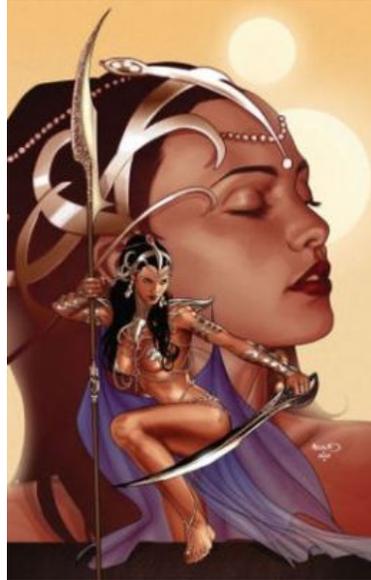
### **On the virtual Moon:**

“This will be my last shift.” The Amazon Warrior spoke generally to the team but looked nobody in the eye. They would be waiting an hour or more right here, so it was as a good a time as any to make the announcement.

“Isn’t this kind of sudden?” the Wizard asked. The team's counselor seemed to lean even harder on his staff and his misshapen hat seemed to droop farther down.

“Yes it is, sorry for the suddenness, but I got a good job offer on the outside,” the Amazon Warrior responded, “I couldn’t really talk about it until the offer was final and they insisted on an answer today.”

“What’s this you’re saying?” the navigator, a plum Princess of Mars, queried anxiously. “You’re not really leaving are you?”



**A Princess of Mars in plum robes <sup>5</sup>.**

The five members of the Digger03 Shift 1 Team, the Rocky Horror, stood in a group well away from the mass of other players in the stands. On the virtual Moon they were: an Amazon Warrior; a wizard; a princess of Mars; a denizen of Sherwood Forest, and Inc. Falcon Three Digger. The member of Robbin Hood’s ban was the jack-of-all-trades who able to could stand in for any team member in a pinch. Digger03 was the incorporated person robot dump truck who did all the actual work on the real Moon. On the real Earth these five had no such identities and were scattered across three continents, but they were all part of the Massive Online Vetted Expedition, the MOVE team, which was finally breaking ground for a human lunar settlement.

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Lunar South Pole Region and Earth.

On the real Moon:

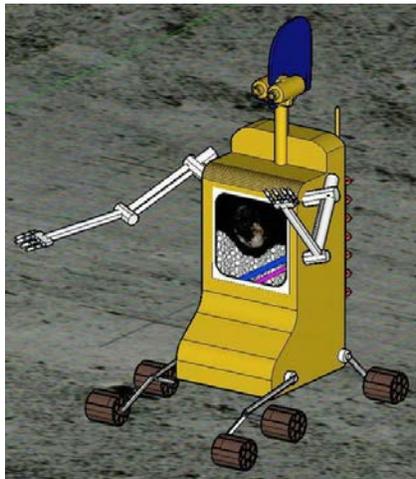
The top of the Scott A Massif was bathed in the harsh sun and long shadows that are characteristic of a near-polar location on the Moon. The Sun was well up now, a week into the lunar month, but was only a few degrees above the horizon. It rarely got above 10 degrees high here at the construction site for the first human lunar settlement, Armstrongville, Moon.

The Earth hung in the sky due north. It was always there in the same place, making a lazy figure eight during the course of a year. It never got more than two hands above the horizon but rarely dropped below it. Mother Earth was the MOVE team's best friend, always there, always comforting, always ready to communicate.

The Earth's disk appeared much bigger than the lunar disk appears back home, almost four times larger and always near the horizon. The Earth disk could always be seen but on the ground the shadows could be a problem. If you were in the sunlight, your camera eye had to adjust to block most of the harsh light and the shadows were jet black. If you moved into the shadows though, and let your equipment adjust, the Earth shine provided plenty of light to see by and even take detailed images.

The Earth went through phases as the Sun traveled its circling path, always near the horizon. It was now a week after midnight, the sun was due east, and the waning gibbous Earth gave a fine glow, throwing light at right angles to that of the Sun.

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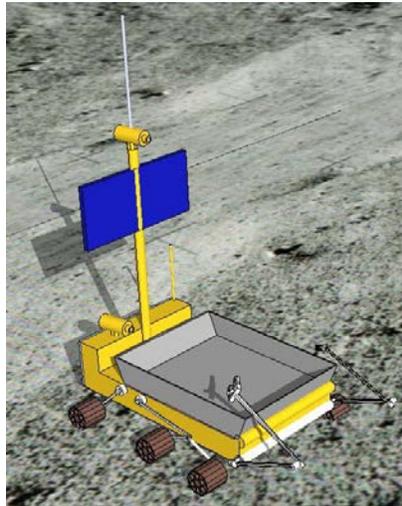
### **On the virtual Moon:**

“How long will it take to replace her? “ Digger03 asked. On the virtual Moon, Digger03 was half humanoid robot and half dump truck with a tall neck, two camera eyes and a solar-cell blue crest on its head. It had a boxy six-wheeled base, and a metal backpack that was often full of rocks. Digger03 never liked to push the capabilities of its artificial intelligence, since what intelligence it had was split between Earth and the Moon, nor did it make a big deal out of being

legally a real person, unless it felt threatened. When it became necessary, Digger03 could take a safety action or ask a simple question on its own. How else could it learn?

“Only a shift or two at most,” the Wizard replied. “Jack-of-all can fill in for now. There is a long queue of qualified candidates for all the Digger rover positions. You probably won’t get as much as one shift off work.”

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Inc. Falcon Three Digger on the real Moon.

On the real Moon:

Digger03 sat alone, resting in a slight depression with its camera held high. This gave it a clear view of the trench running east to west before it. The trench was 22 meters wide at the top with a V-shaped cross-section and a four-meter flat area at the bottom. The depth was a little over eight meters. This trench now ran for about 30 meters and ended with a large boulder. This stone was simply too large to drag out of the trench. Dealing with it in a decisive manner was the order of the day.

Only a few years before a robot mission, the Lunar Reconnaissance Orbiter, or LRO, had carried instruments specifically designed to measure the danger of space radiation to human beings. The results were not what the space enthusiasts wanted to hear. The radiation danger for humans in space is much worse than had been foreseen, in fact, it is about twice as bad.

There are two separate radiation dangers for a manned space mission, Coronal Mass Ejections, CME or solar storms, and Galactic Cosmic Rays, or GCR. All previous manned lunar missions had been designed considering solar storms to be the worst danger, but that idea turned out to be wrong, dead wrong.

The real problem is GCR. Galactic cosmic rays are not as concentrated as a CME at its peak, but they are very penetrating. They are present 24/7/365 and they will go through a space suit; they will go through a spacecraft skin; and they will even go through a meter of lunar regolith. To

make matters worse, insufficient radiation shielding works against you. A thin shield only increased deadly secondary radiation.

The answer was to dig and dig deep. A shield of five meters of lunar regolith would provide about as much radiation protection as the Earth's atmosphere. That was considered acceptable and became known as "The Five Meter Rule". The air pressure in an inflated habitat can easily support that much mass in the Moon's modest one sixth g.

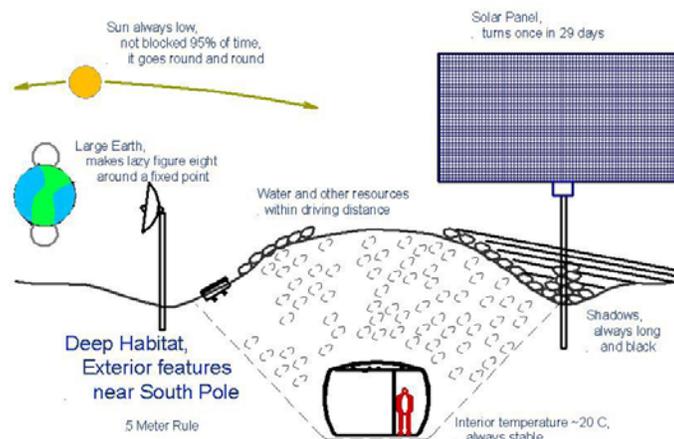
But it would take years to dig deep trenches for habitats on the Moon. Where would the money and manpower come from?

The answer was the 21st century answer. Organize a million people on the Internet and just do it. So the MOVE concept was born.

Someday soon, they all hoped, a lunar habitat would be flown in from Earth and inflated along the bottom of their trench. Then the digger teams could get back to work to cover it with the five meters of lunar regolith needed for radiation and thermal protection. It had been a big dig to get the project this far; it will be a big dig to continue. It will always be a never-ending big dig as long as there are people who want to live on the Moon.

The boulder that was their focus today was enormous, too big to lift or drag, even with two rovers and even in the Moon's low one sixth g. There was no option but to blast this obstacle and there was nothing the MOVE team players loved more than a good blast. So it was party time on the virtual Moon. Blasting provided a fine relief from the endless drudgery of trenching.

The specially equipped mineral exploration rover, Powderman01, was now finishing drilling a line of holes in the boulder and was about to place the explosives. Once the sticks were in place, the only safe thing to do was blow the rock to smithereens.



Future Deep Habitat exterior and cross-section.

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**On Skype:**

“Wizard, did you know Amazon Warier was leaving?” demanded Princess of Mars. She had opened a private line to him without including the rest of the team.

“I only found out about it a few minutes ago,” he assured her.

“She can’t do that, can she? I mean, doesn’t she have to give notice or something?”

“No, she doesn’t have to. We are all volunteers here,” the Wizard replied. “Any of us can leave whenever we need to. Of course, this abrupt announcement will have consequences. It’s unlikely she will ever get a slot on another lunar MOVE team, not trenching, and certainly not exploring.”

“I must talk her out of leaving then,” Princess of Mars interjected.

“Too late,” said the Wizard, “Just an announcement about possibly leaving sends you to the back of the queue. With thousands of qualified people suddenly in front of you for every possible position, so there’s nothing left to do but leave. What’s done, is already done.”

“After all her work, she won’t have anything more to do with settling the Moon?” Princess of Mars was clearly seeing herself in the Amazon’s place one day too soon.

“She has a new role. Now she’s a Moon Dig alumnus, and having as many of them as we can in the real world is more important than any single MOVE team member.”

“I thought we were doing real things to build a real Moon settlement.” Princess of Mars spoke ruefully, in a calmer but sadder voice.

“Yes, we are,” continued the Wizard, “and the people of Earth could go ahead with an ambitious human space program any time they get up the political will to do so. The trenches we dig and the rover path-finding expeditions we complete are vital, but our real strength is building up a cohort of hundreds of thousands of people on Earth who have a deep personal commitment to space exploration.”

“You make all the hard work we do sound inconsequential,” retorted Princess of Mars.

“Our MOVE teams have dug a few tens of meters of trenches and blazed a few hundred kilometers of new trails. The same things could have been done by a big government program in a few years, but the political will wasn’t there. So we’ve done it as a Massive Online Vetted Exploration. Hundreds of thousands of people on the Web have spent millions of hours studying, training, playing simulation games, and talking it all up. The old 20<sup>th</sup> century way to explore space got us Apollo to the Moon, but it did not get us back to the Moon in 50 years. So we built a new 21<sup>st</sup> century process for space exploration in only five.”

“And Amazon Warier was in the MOVE team almost from the start,” Princess of Mars emphasized.

“Truth be told, she's been in longer than me,” admitted the Wizard. “And now she has moved on.”

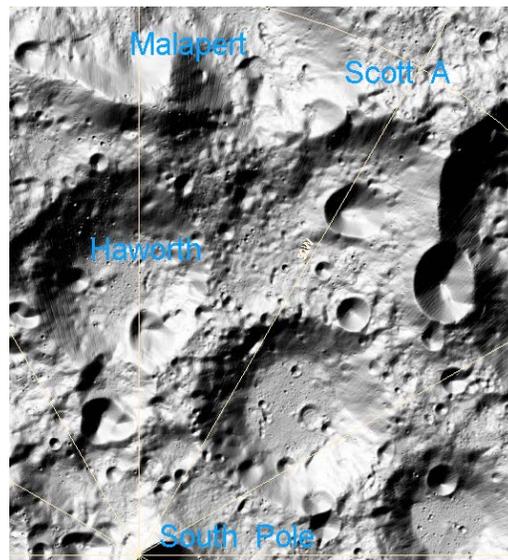
“Do you know where she is going?”

“Our Amazon Warrior has gotten herself a good position with a high-tech firm. That's just where we need our graduating people to be, in places of power and influence where they can turn our mass spacer movement into real people on the real Moon.”

“I still think she should have told us earlier,” lamented Princess of Mars.

“Welcome to the 21<sup>st</sup> century.” The Wizard, shrugged and rang off.

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Lunar South Pole Area.

On the real Moon:

The Scott A Massif is a ridge running roughly east to west and about 6 kilometers high. It has sun for power about 95% of the time and continuous line-of-sight to Earth. It has a buildable area of about 36.5 km by 22 km and at least four routes that never exceed a grade of 20% to the permanently shadowed craters to the south and below.

On a small rise sat a box of electronic equipment covered in gold blankets. This box overlooked the dig sight and had a clear view of everything. It even had a clear view into the dark and the cold that filled most of the 120 kilometers between the Scott A Massif and the lunar South Pole, but little there could be made out among all the shadows.

On the top of this box was a pearly white thermal panel, and above it was a gun-metal blue

solar panel. The thermal panel was fixed near-horizontal and faced deep space, but the solar panel was mounted high on a central mast and nearly vertical. It rotated once a month to follow the low-angled sun.

The box held several two small telescopes that provided laser communication with Earth and several antennas for microwave, both to Earth and to the local rovers. On its mast was a complex camera with full pan and zoom capability. This camera was the foundation for the virtual Moon.

In the more or less flat area to the west of the rise were two trenches. The first ran 40 meters north-to-south and lay complete and open. The new trench ran east-to-west and its first, now nearly-complete section, ran for 30 meters then ended abruptly with a large boulder. When complete the new trench would form a right angle to the first one.

Both trenches ended with ramps, and a multitude of rover tracks run up the ramps and fanned out to various yards where the loose material from the dig had been dumped into piles. In addition, rocks of various sizes have been sorted and laid out in a checkerboard pattern so they could be individually located if a particular rock was needed for construction later on. As a general rule on the Moon, the deeper you dig the more and bigger rocks you find.

The entire surface of the site and, in fact, nearly the entire Moon is covered with fine-ground powdered rock call regolith. You cannot really call it soil as it holds no organic matter and no water at all. Millions of years of gardening by micro-meteorites has turned the Moon's top several meters into sand, gravel and loose rocks, and its top six centimeters into very fine powder.

The regolith grit was the dig team's worst enemy. It destroyed seals and wore out bearings; it wrecked equipment. Digger01 sat on a small rise with two wheels and an elbow frozen. It was now little more than a camera platform. The grit had done it in and would be the death of Digger03 one day.

The edges of the trenches are marked with a line of rocks so that a rover will not get too close to the edge and cause a landslide. When you were on the Moon and needed something, you first made do with whatever pieces of the Moon that came to hand.

A few spent landing vehicles that had brought the rovers to the Scott A Massif were also scattered around the plain. They were now junk much too valuable to throw away.

The plan for a magnificent future Moon settlement, called Armstrongville, was all laid out in great detail. Key reference points were marked with piles of rocks called cairns.

Each cairn was a distinctive shape and each could be considered a work of art. Some cairns had bits of color of Earth origin, perhaps a bit of gold blanket, but the bulk of the structure was a stack of the monotonous gray lunar stones piled as high as a Digger could reach. Deep in the

foundation of each cairn was a flat rock with the names of the responsible dig team inscribed on it. The long shadow cast by the cairn, changing over the lunar month, was as much a part of the piece as the stones themselves. Human beings have marked their paths with stacks of rocks since the Stone Age, and now the art of the cairn is the art of the Moon. A cairn on the Moon can easily last a million years.

There were no human footprints anywhere to be seen. No human being had set foot on the Moon in more than 50 years. What the cameras did see is the magnificent desolation that is the Moon and, to the south, they could see only the cold and the dark where the water lies.

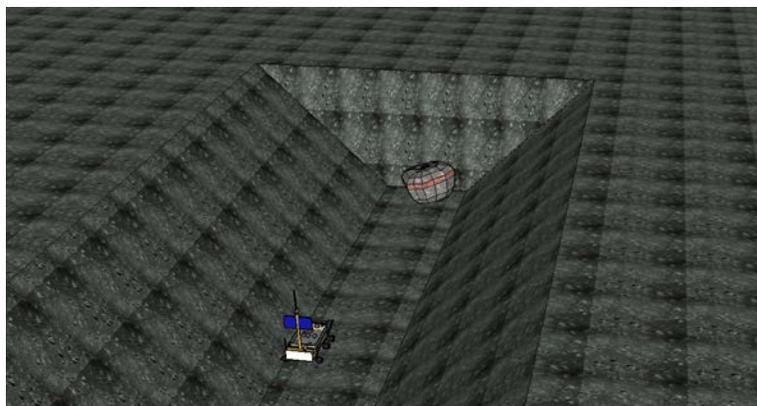
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### **On the virtual Moon:**

The full MOVE team was gathering, thousands of them. The amphitheater on the hill side below the communication box was now nearly full, holding a wide assortment of wizards, princesses, demigods, and trolls. It presented at the same time a display of finery and a macho strut. They were all there to see the blast and to be seen. A handful of dignitaries filled a VIP box. That box that was protected by a firewall and nobody paid them any mind.

The view from the stands of the soon-to-be-smashed boulder was very good, much better than on the real Moon. The computers on Earth could combine many views and light settings to build a full panoramic view of the scene and then embellish it. And the virtual people could get right up close. No one here was worried about being hit by a fragment of flying rock.

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Trench 02, the rock, and Digger03.

On the real Moon:

The boulder in question was about the size of a pickup truck and had a distinctive pink vein: it was a crater erratic. Its composition did not match the minerals on the Scott A Massif. It had arrived at this location eons ago on the fly from some distant cratering blast. It was clearly

lunar material, but from deep below the lunar surface. This boulder had a history.

The pink vein was the calcium-rich mineral Oligoclase, a feldspar containing calcium and silicate. Back on Earth, It would be the semi-precious gem, Sunstone. On the Moon, in a world of grays with all the hue variations of an old asphalt parking lot, color attracts attention. A pink vein running through a large rock is significant and well worth study.

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**The Wizard.**

### **On the virtual Moon:**

“I wonder about the boulder’s history,” said Jack-of-all, not certain what to say to either Amazon or Princess of Mars and clearly happier simply dodging the upset.

“It is an old and violent story,” the Wizard recounted. “It started several billion years ago, not long after the crust of the Moon formed but after the materials in the crust and core had separated.”

“Do we have time for this?” asked Digger03, glancing at the countdown clock hanging over the scene.

“I’ll keep it short,” replied the Wizard and continued undeterred. “A huge asteroid struck the Moon on the side away from Earth and south of the equator. It blasted the South Pole–Aitken Basin, one of the largest in the solar system. But that was a very long time ago, and many smaller strikes have occurred since then wrecking its majesty. The massif we are digging, Scott A, is a remnant of one of the outer rings of that once-majestic basin.”

“So the boulder was thrown up in the formation of this basin?” asked Digger03.

“No,” continued the Wizard, “when craters form material from the inside of the crater is blasted up and falls down to form the rim. In this process the material often gets turned over and the layers end up-side-down. It is like cutting a stack of mixed pancakes in half and flipping one half on top of the other.”

“So, Scott A is upside down material,” proposed Digger.

“No again, Scott A is made of old crust material. The up-side-down flip is chancy. But somewhere out in the hills to our east and west are now great swaths of materials from deep within the Moon. Over time these patches have become covered with a mix of regolith thrown in from everywhere, so the useful minerals can be hard to spot. To make matters worse, the big basins were flooded with lava hiding from us the materials from deep within the Moon that were their original bottoms.”

“Then how did our boulder get here?” asked Digger.

“Millions of years later a fair sized meteor must have hit in one of those mineral hills and blew our boulder to the top of this ridge. Just by chance it happened to fall into a small existing crater and so did not roll off the mountain,” the Wizard finished up.

“Why is a little pink in a rock such a big deal?” asked Jack-of-all.

“Truth be told, it probably is not. But it is a good talking point just the same. We need to use the resources of the Moon in every conceivable way if we are ever to get the Earth money we need to really build a settlement.”

“We have proved we can dig the Moon,” Jack-of-all boasted.

“Digging a trench and mining ore are two different things,” cautioned the Wizard. “Ores are notably rare on the Moon. Nearly all the ore deposits on Earth were created by the action of water, biology, or plate tectonics. The Moon has never had liquid water, or biology, and is simply too small a planet sphere to support plate tectonics.”

“So of course we get excited about anything that could be a lunar ore,” agreed Jack-of-all. “But what good is Oligocase?”

“It is a possible ore for calcium,” the Wizard stated.

“You mean, like bones and teeth.”

“On the Earth, bones and teeth, on the Moon, it’s for electrical power transmission. A lunar settlement will need a lot of power. Thanks to our location, we can put a billboard-sized solar panel on a pole at a high point on Scott A and harvest all the nearly uninterrupted power we

need. But that peak is more than a kilometer from our construction site. How do we move all that power?"

"I can see that it would be a waste of resources to ship huge coils of copper cable from Earth," Jack-of-all ventured. "But I've never heard of calcium being used for power cables."

"Calcium reacts strongly with water and oxygen. On Earth you only see it in its oxidized state, as a white pigment. On the Moon there is no oxygen and only the minute traces of water. So we can use the metallic form," the Wizard proposed.

"Then metallic calcium is a good electrical conductor?" asked Digger.

"Only fair," replied the Wizard. "But the ore is relatively easy to reduce to the metal. Aluminum is a better conductor and it is common on the Moon, but processing it would require a huge industrial investment and enormous amounts of energy."

"The explorer teams will go looking for where this boulder came from, for sure," said Digger. "Even the shoebox rovers can do that."

"Yes," agreed the Wizard, "even the shoebox rovers, built by students and makers, and launched to the Moon from under the wing of a retired MIG 25, can go seeking the mineral hills of the Moon. They don't even have to climb any of the mountains. They only have to find every accessible crater erratic and give it a good onceover with their rover's ultraviolet light and multicolor vision. They will roam from here to the far side and back again inventorying every promising rock."

"That should keep the exploration teams happy," Digger03 noted.

"And our alumni can talk up all the resources they find," added the Wizard.

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On the real Moon:

Powderman01 had completed and cleaned out all the drill holes. It very carefully removed a stick of explosive from a box on its back and slipped on a cap containing the detonator and trailing a wire. It then placed the explosive stick in a hole and pushed the charge in with a long rod built into its arm.

From this point on, a solar storm could easily provide enough stray electrical charge to blow a stick. Not only would it do in Powderman01, but the mistimed explosion could not even be counted on to split the boulder properly. But the Sun is monitored and you can depend on at least a few hours warning for every one of the zero to five solar storms that hit any site on the Moon each year. When the trenches are finished, one of their key functions will be to shield

people from just such storms.

Powderman01 finished setting the explosive and slowly rolled down the length of the trench paying out a fine cable. It then huddled down in a small crater just off the trench ramp. It was ready.

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### **On the virtual Moon:**

The crowd went wild. The huge countdown clock hanging over the trench rolled over to zero. A huge banner reading "Fire in the Hole" flashed above the clock.

The boulder shuddered and split into pieces. A few small bits of rock went flying in high arcs in the Moon's one sixth g. Each piece of flying rock was tracked and marked by a spherical image the size of a soccer ball. The front row of spectators took off at a dead run. Jostling and pushing, they tried to head butt the balls, but to no avail.

Those remaining in the stands did the wave, a wave that did not simply travel from one end of a stands to the other but rather one that spread out in patterns. Their wave was a stone thrown into still water.

Jack-of-all stood his ground and tried to take out as many balls as he could with his long bow. In the end he was credited with two hits.

The explosion itself did not amount to much. After all, it was designed not to throw rocks and the MOVE team had voted out a big explosive sound as simply too phony in the vacuum of space. The few dozen geophones scattered across the Moon easily picked up the blast.

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On the real Moon:

Powderman01 reentered the trench and surveyed its work. The boulder had been well split. No remaining piece was too large for a two rover drag out of the trench. Powderman01 carefully picked out samples of the pink vein for further study.

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### **On the virtual Moon:**

"I am sorry I could not tell you sooner," apologized the Amazon Warrior. "I did not find out that I really had the job until a few hours ago. You just don't want to spoil something good like a job offer by bragging about it before you truly have it nailed down."

“The Wizard says you can’t take your announcement back and there is nothing we could do now to talk you out of it anyway,” said Princess of Mars, “but I have a right to be upset.”

“You certainly do,” conceded Amazon Warrior, “I wish I could tell you more, but it is all hush-hush. The job is with a new high-tech startup and they will be doing an IPO this year. Everything they do now has to be secret just so they cannot be accused of artificially jacking up their stock price.”

“I hope you get some stock options,” added Jack-of-all.

“Yes I do, but everything turns on the company having a bang up year,” continued Amazon Warrior. “From now on I will have to put every hour of my time and every ounce of my energy into the company.”

“So no more Moon Dig,” ventured Jack-of-all. “I hope they gave you credit for all your Moon Dig work.”

“Yes, they certainly did,” she stated emphatically. “I would have never gotten this job without my Moon Dig certificates. My BA in history certainly does not impress anybody these days.”

“Good news!” the Wizard exclaimed. “I just got word from the Moon Dig coordinating committee. Our team will not be disbanded. Amazon Warrior’s leaving was ruled normal turnover since she had been in the post for nearly a year. Jack-of-all is our new team commander and a replacement team member will be joining us shortly.”

“You mean the whole team could have been disbanded?” interjected Princess of Mars.

“Yes. With thousands of qualified people ready to take on any position that becomes open and new teams for new rovers so rarely needed, any disruption is likely to fold a team,” the Wizard explained. “It takes time for a team to recover after losing a member so efficiency suffers, but it takes time for a new team to become efficient too. The decision could have gone either way.”

“But we are all in,” said Digger03.

“You will always be in, Digger03,” emphasized Princess of Mars. “You are stuck on the Moon till your wheel bearings freeze.”

“Do we get to keep our cairn?” asked Amazon Warrior. An officially disallowed cairn would very quickly become the source of good rocks for other team’s cairns and would simply melt into the ground.

“Yes, we keep our cairn,” the Wizard reassured her. “We can add the new team member’s

name to it later.”

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On the real Moon:

Powderman01 rolled out of Trench02 taking a few samples of pink rock with it and recoiling its detonation cable. Digger02 rolled in as it left to start the cleanup process. Digger03 would soon follow. The slow pace and the grueling work of trenching on the Moon picked up right where it had left off. On that quiet mountain ridge, the serenity of the real Moon was restored.

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### **On the virtual Moon:**

The spectators poured from the stands. A swarm of assorted TORDIS's, Flash Gordon spaceships, and fighter jets went whizzing away in the direction of Earth. The mass of the crowd hurried around to a draw on the back side of the rise to claim their steeds.

A thundering herd soon broke from behind the rise. It was led by Cheetahman who was followed closely behind by every conceivable animal, real or imaginary, humans have ever dreamed of riding. A bunch of skeletal cowboys even drove a herd of glossy black steers with steel hooves and snorts of fire and smoke. The empirical walkers brought up the rear as this screaming pack took a victory lap around the settlement site. Yet none of them left a single track in the endlessly patient lunar regolith.

An Amazon Warrior slowly turned away from the mesmerized Rocky Horror team, walked a few paces, and simply faded away.

A medieval lady of significant personal bearing and riding a green triceratops broke from the circling throng. She pulled up the enormous animal in front of the Rocky Horror team and dismounted into a curtsy with a grand sweep of her hand.

“Greetings to my new team,” she called out. “You can call me Guinevere.”

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## Essay:

### **MOVE: Massive On-line Vetted Exploration**

When you are Hot,  
You are Hot.  
When you are Not,  
You are Not.

Human space exploration has been not for several decades now. Maybe it is time to try a different approach.

Some people are working the commercialization of space and that is fine. This approach will work well for efforts that have clear cash monetary value, like communication satellites, but it will do nothing for general space exploration, which is much more likely to generate value to society rather than cold hard cash.

To make matters worse, recent robotic space expeditions have shown that the danger from radiation for people in space is about twice what we had thought. This means that all of the spaceships and space stations you have ever seen in movies and TV are just plain death traps. We need to redesign them all.

So what is hot right now? Electronic games are hot. MOOC's, Massively On-line Open Courses, are hot. Robots are hot. Crowd efforts are hot.

This short story proposes a new approach to human space exploration. It is a proposal to do everything hot until we find a way to make some of the heat rub off on human space exploration itself. This approach is here named MOVE for Massive On-line Vetted Expedition and is basically a plan for one bootstrap after another until we are back on the Moon.

MOVE starts with on-line games (Hot) based on real science data. To play the game you will need training for real tele-robotic operation and space settlement design (MOOC, Hot). To improve the game, and everything will be crowd designed and tested so you must spend the hours needed to understand the mass of available data on the Moon.

If the training and game catch-on, that is go viral, then we will have a large and enthusiastic fan base for the next step, a small exploration rover on the Moon. Such a trip is commercially available today for around 1.5 million dollars a kilogram (the Moon is metric). Such a price is

within the reach of successful games today. The big prize in our early game then is to become a tele-operator of a real lunar rover.

If the viral energy continues, then we will find the resources to ship small exploration rovers and then a digger rover to start construction of the next lunar settlement, here called Armstrongville, Moon. This period is the time of this story.

Only when all is ready and an enormous number of people are highly trained for every task, will we send the actual habitats. Then and only then, people can return to the Moon.

A long shot, yes. Impossible, no.

Enjoy,  
Tom Riley

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