

Babies on Mars are being born without higher brain functions. Can Marion figure out why soon enough to save the colony, their freedom to return to Earth, and perhaps her own child?

The Music of the Spheres

by

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Marion Chan wiped sweat from her eyes and leaned on the railing, staring across the airy expanse of Home Dome. Beyond the transparent panels, the long, rising flank of *Olympus Mons*, the largest volcano on Mars,

and the colony’s namesake, swept off to the pinkish-grey

horizon. Her solo game of racquetball had done her *some* good, the endorphin-pumping exertion and the chance to work off some frustration leaving her feeling almost good.

Almost.

A thin rattle rose below, pulling her gaze down toward the floor of the dome, twenty meters beneath her. A robotic excavator churned away at the Martian basalt, digging out new living quarters for a geophysical team arriving on the next flight from Earth. It wouldn't launch until the next favorable alignment of the two planets, four months from now, and wouldn't arrive at Olympia until nineteen months after that. But the excavator needed two months to finish the excavations, then the basalt had to de-gas for six months, and then the tunnels had to be sealed against leaks...

And the return flight would carry the colony's three functionally brain-dead babies—the first children ever born away from Earth—back...not home, because home was here. Just *back*.

She looked up again, at *Olympus Mons*. Close up, the enormous volcano was just a rusty brown, boulder-strewn slope framed by dusty, pinkish sky—boring, really. Marion often wished they could have located somewhere more scenic; maybe near the immense canyons of the *Valles Marineris*. But much of the planet's bedrock had proven too unsound for excavation, thanks to deep weathering of the *planitia*, the sprawling Martian lowlands. Only the relatively young, sound basaltic flows of *Olympus Mons* and her sister volcanoes had the structural integrity needed for their excavations.

"Time?" Marion asked the air.

"Fourteen-fifty-two," the computer said. That meant Sandra Torgerson had been in labor for...what? Almost seven hours?

A flicker of white pulled her gaze back down. A small grove of fruit trees—apples, peaches, and plums—stood below her. The white movement was a rabbit, nosing through the grass beneath the trees. Rabbits had been the highest-order organism they'd tried breeding here so

far...except for humans, that is. But the rabbits had worked out fine—

A soft hum behind her ear. It could be anyone calling, of course, with any sort of problem, question, or complaint. But she knew exactly who it would be.

"Yes?"

Garret McVie, Olympia's Chief Surgeon, said, "I just finished the brain scans of Sandra Torgeron's newborn."

Marion closed her eyes, shutting away the fruit trees, the rabbit, the tedious scenery outside the dome. That was all Garret said, but his bleak tone told her all she needed to know.



Marion allowed herself a momentary stretch, then forced her eyes back down to her terminal. It listed every factor she, Garrett and the Colony's other section heads could think of that pertained to conception, gestation, and birth on Earth. Against it, one-to-one, were mapped the equivalent factors for Mars. The lists went on, screen

after screen. Marion felt like she knew every last character of all of them intimately, she'd read them so often and closely.

The door chimed. She didn't even look up.

"Come in, Garrett."

He entered and immediately slumped into a chair. Behind him hung Marion's only truly personal possession, a Tunisian-crochet wall-hanging her great-great-grandmother had woven, about the same time Neil Armstrong had walked on the Moon. The intricate, fiery rendition of a famous Han Dynasty mural, *The Phoenix Makes Its Appearance*, had since passed to daughter, to daughter, to daughter, a mother-to-child continuity of life's experience.

"I got those birth statistics from Earth," Garret said, rubbing his eyes.

"And?"

"And, babies are being born back home the same way they always have...alert, healthy, with no more than the usual number of defects and problems."

Marion frowned. Garret had just called Earth *back home*.

She made herself ignore it. "So it's definitely something here, then."

Garrett closed his eyes and rested his head against the crochet. "I've got the state of the art in medical technology here, not to mention half of the doctors on Earth falling over themselves to help. But we can't find a single thing wrong. No pathogens, no chemicals or other environmental contaminants, no evidence of radiation effects, genetic damage, nothing. These kids should be as wide-eyed and bright as any baby on Earth. Except, they're not."

Marion leaned towards Garrett. "Then it's something else."

He took a long breath, let it out.

"It's not just these families, Marion. It's all of Olympia." He looked up at her. "We might have been pushed into allowing children here too soon, but it was going to happen eventually. It has to. Because, if we can't have children out here, then—that's it. Earth is all we'll ever have."

"I know."

He puffed out another breath. "How long until they just shut us down, and bring everyone home?"

She held his eyes. "Would they even do that?"

"What do you mean?"

She gestured at the terminal. "That incoming geophysical crew? It's been cancelled. The next ship's robotic. And they haven't given me any return data for it."

"Oh. Damn. They're writing us off."

"Can they risk having what's happening here spreading to Earth?"

"No. Of course they can't."

Marion reached out and squeezed Garrett's hands. "So we have to find an answer, don't we?"

His eyes were still bleak when he nodded, but Marion thought she saw a spark of determination in them. It wasn't much, but it would have to do.



They'd filtered the air. Sampled the electromagnetic spectrum from end to end. Detected every particulate emission they could imagine, measured every magnetic and electrical field they could find. They'd tested the water, the soil in the habitat domes, the food, both pre-processed and fresh. Grown cultures of bacteria, isolated viruses, even matched stray bits of DNA against their database of everyone and everything alive in the colony. Collected samples of blood, tissue and every other secretion and emanation of bodies, human and otherwise.

Then they'd collated the results and found...nothing. Or, more correctly, nothing useful. Everything was exactly as it should be.

Someone eventually suggested that perhaps it had nothing to do with particles or germs or chemicals. Perhaps, they'd said, these babies had no souls. Souls, maybe, were the exclusive product of Earth, because Earth was where man belonged.

"Can you blame them?" Marion said, once Garrett's rant against what he called such 'mystical nonsense' had finished bouncing off her office walls.

"It's superstitious crap!"

"Are you sure?"

He glared at her, then snapped, "No," and stormed away. His departure left the *Phoenix* Tunisian crochet swinging against the wall, a stately, morphia-slow pendulum in the low Martian gravity.

"Mother," she said to it, "what's happening? What are we missing?"

The crochet swayed, whispering white-noise as it rubbed against the annealed basalt, but offered no answers.



Marion awoke to nothing—just darkness, the soft hiss of air, the thrum of distant machinery. Everything was as it should be.

That was the problem. Everything was just as it should be. It meant whatever was wrong was something that just *seemed* to be right.

She closed her eyes, but sleep eluded her. She finally lifted herself out of bed and sat down at her desk. The movement triggered the computer to flash a prompt on the screen.

GOOD MORNING, MARION.

She stared at it. She hadn't planned to use it; it had simply done what it was programmed to do.

GOOD MORNING, MARION.

Marion touched a fingertip to the glowing words. A prompt, anticipating her need. Hadn't this machine just

displayed more reasoning than all four of the Martian babies combined?

Why?

Marion let the midnight thinking roll on. Why, for that matter, couldn't the computer out-think her? The power and capacity of the Olympian computer network vastly exceeded that of her brain. The best signal transmission speeds of the neurons in her head were far, far slower than those of fiber optics, or even just copper wire. And while digital processing and communication thrummed along at hundreds of millions of cycles per second, human neural frequencies managed...what? A handful of Hertz at best?

So why didn't the Olympian computer system wake up? Why didn't the Internet, now networking planets and space stations, become self-aware?

What—putting aside the question of the soul—was so special about the human brain? Other than the fact that it worked, it certainly wasn't very impressive.

On impulse, Marion touched the terminal and started to reason out a database query. She wasn't exactly sure what she hoped to find, but was prepared to spend as long as it took looking for it.

Which made her finding it less than five minutes later all the more stunning.



Garrett frowned. "Schumann Resonance?"

"It's an idea," Marion said, looking at her terminal. "I mean, there's the magnetic field thing, the fact that Mars doesn't have one to speak of. But this...." She shook her head. "I don't know, it feels right, Garrett."

"So this Schumann Resonance is...what, unique to Earth?"

Marion shook her head. "No. You could calculate the Schumann Resonance of any planet, based on its radius, and the speed of light. In the case of the Earth, the biggest peak works out to about seven-point-eight Hertz. At that frequency, lightning strikes make the space between the Earth's surface and the ionosphere ring with

EM waves like a tuning fork. And there's about fifty lightning strikes every second on Earth, twenty-four hours a day." She pointed to another part of the display. "Seven-point-eight Hertz is also in the middle of the Theta and Alpha parts of the human brain wave spectrum, right on the border between sleep and waking." She looked back at Garrett. "So far, every single human being has been born, and has grown up, inside that Schumann field."

Garrett stared at the screen. "Except for four."

"Except for four. So this could be it, Garrett. Our brains might have evolved so that they *need* to develop inside a seven-point-eight Hertz EM resonance field, for some critical period of their growth, at least."

"We've bred terrestrial animals here, though."

"Bugs, rats and mice, a few rabbits. And they've developed normal, healthy physiology—just like the babies."

Garrett continued staring at the screen, saying nothing.

"We certainly haven't delved very far into all the nuances of the animals' brain development, though," she went on. "Not before Earth started pressing us to make some human babies. I mean, we've been calling these children brain-dead, but they're not, really, are they?"

"No. All of the lower-order functions are there. Based on the scans we've done, it's the capacity for higher thought that seems not to have developed."

"How much *higher thought* is a mouse or rabbit supposed to have?"

Garrett narrowed his eyes. "Okay, let's assume you're right. Mars must have a Schumann Resonance, too."

"It peaks at about fourteen Hertz, yes, because it's a smaller body than Earth."

"And that's somewhere in the...what, the Beta range? That should correspond to intense mental activity."

"It would."

"But?"

"But Mars is dry. There's virtually no water. The atmosphere isn't very conductive. There's a little lightning generated by dust storms, but not very much. The Martian field is so weak, in fact, it's basically just lost in random EM background noise from the Sun."

Garrett looked back at the screen. Marion waited.

He finally nodded. "This could be it. The problem is going to be verifying it."

"We go back to the animals. We study their development, see if there are measurable effects."

Garrett nodded again, suddenly infused with the spirit of the thing, the chance to do something positive. "I suppose we could generate an electromagnetic field, a sort of artificial Schumann Resonance like Earth's, and see what effect it has, too."

"We can. We can do all those things."

He looked at Marion. "But, we're eventually going to have to try again, having a baby."

She nodded.

"I can't imagine asking someone to do that."

"No," Marion said, "neither can I."



Another contraction slammed through Marion. She groaned or cried or maybe even screamed, wasn't sure which and didn't care. She just wanted it to be over.

But didn't, because then she'd know.

She'd told Garrett she couldn't imagine asking anyone else to carry another child to term, artificial Schumann resonance field notwithstanding. He'd finally given in, but couldn't imagine asking anyone else to do it, either. Not as a mother, or a father, because they might be wrong. It might not be the resonance field at all. It might mean another life lost before it began. So they talked to Earth and rearranged their work, because how could they expect anyone else to—

Another contraction. This time, she did scream, loud and long.

"There's the head," Garrett said. "Okay, Marion, push!"

She did, until it was done, and Garrett held their daughter in his arms.



They stood in the observation dome, watching the outbound ship lift just as dusk came creeping down the vast flank of *Olympus Mons*. Its exhaust faded against the purpling sky, flared again in the high veil of carbon dioxide ice-clouds, then dwindled away to darkness.

The first Martian children and their families were going...not home, because home would always be here...but back to Earth. There was talk of following up on the work done by Garrett and his team, of trying to stimulate something resembling higher order thought in those poor, catatonic babies. The human brain, it seemed, needed to develop from scratch in a particular, all-encompassing resonance field; it needed that pervasive aura to stimulate that first spark of

awareness. Deny it to a cockroach, and there's no real effect. Deny it to a human being and that elusive thing called *thinking* simply never is.

A wet sneeze pulled Marion's gaze down from the sky. Emily probably needed changing, and then a bottle before her nap.

"Do you want me to take her?" Garrett asked.

Marion smiled at her daughter. "No, we're good."

Emily's head lolled back and forth, trying, but not quite keeping up with the exchange.

Marion looked back at the *planitia*, the plains sprawling below *Olympus Mons*. She imagined it covered with water. Terraforming...that was somewhere on the Martian to-do list. It was far, far down the list—far beyond her tenure—but it was there.

Oceans on Mars. Water vapor in the atmosphere. Clouds, and storms, and lightning.

Fourteen Hertz was twice the Schumann Resonance of Earth. The frequency of intense mental activity. What would that do to a developing brain?

Emily fussed some more. Marion tried the pacifier, but her daughter would have none of it. She gave up and pulled her from the snugly, dragging the crocheted wrap macramé swaddling her along with it. It made a perfect blanket, her great-grandmother's *Phoenix* peering severely across the tiny shoulders. Emily goggled her eyes, gurgled, then spit up some of her last meal. Marion watched the lumpy fluid fall—slowly—until it oozed down the back of her hand.

"Um, maybe you don't need another bottle after all," Marion said. Emily responded with a burp, more curdled milk, then a toothless leer. Marion laughed and turned to Garrett. "Okay, now you can take her."

Watching him heft his daughter, Marion reflected that Garrett really made a damned fine father. Maybe he'd make a damned fine husband, too. Or maybe not. That didn't matter, though, because it had never been the point. Mother, father, and daughter turned away from the deepening Martian night, toward home.



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