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about 10,000 words

# An Iris in Full Bloom

by D. M. Riemer © 2018

"How's the shoulder?"

This from Annika, my tactical. She knew I hated the elevator ride and was just trying to distract me. On average, I could tolerate the quiet descent for maybe 30 seconds, and the trip to the lab took over two minutes. By the time we arrived my heart would be racing, a slick of sweat chilling my face. There was nothing particularly dangerous about the elevator. Low gravity permitted a smaller drive and braking system, lighter cables, not to mention that glassy quiet. But the long vertical ride always had me sliding towards panic. I felt this was entirely reasonable. No one should feel normal dropping 2,000 meters into the Moon.

"It's okay. Little numb, still," I said, and circled my left arm like a boxer entering the ring. Numb was good. Right after surgery, I had awakened to the glittering agony of shattered bone, surely something inflicted by a chainsaw or a bear. In fact, a medtech had forgotten to switch on my SENS unit, implanted to block pain receptors. My screaming created some excitement, and the surgical team soon put things right; the pain hummed away into a warm tingle. I hadn't seen the scans, but Annika told me my left deltoid now enfolded five inches of artificial humorous, printed from graphene foam. She said it was valuable enough to put in my will. I didn't have a will, though writing one seemed like a good idea. The incident team analysts were sure Alex had been aiming for my head.

Alexander Maslow, PhD and likely Nobel candidate, had been my partner, a physicist to balance my own specialized knowledge in exotic materials. For over six months, the two of us had directed work at the site with little supervision, even from our unnamed watchers on Earth. We had spent a lot of late nights in the main lab, talking over each day's data, and then music (turned out we were both Frank Zappa fans), and then everything else. He proudly shared dozens of grinning snaps of his wife and kids. After a while, I talked about my father, and even opened

the door on his sudden, ugly departure. This was a dark story, but Alex listened like an old war buddy. On the day he tried to kill me, I would have said we were friends; we'd planned on authoring a paper together after the whole mess was declassified. Instead, Alex had set an ambush, cradling a power hammer modified into an assault rifle. He fired two shots before Curtis, walking just behind me, returned fire with a businesslike double-tap that killed Alex and probably saved my life. The aftermath was a new, nervous atmosphere, a looking-over-the-shoulder anxiety that slowed us all down, clouded any sense of inquiry with suspicion. The suddenly, bizarrely homicidal Alex was an effect with no visible cause, and it put everyone on edge. But his death made me senior researcher. And it got me Annika, a personal watchdog ever at my side.

My arm healed well, and between the implanted SENS and Tricodone the physical pain was dull background. I'd also been cleared by a military psychologist, who worried about less physical impairments. During her lengthy evaluation I was careful to nod, chuckle, and weep at all the right places, so a month later I was heading back to work. But as the elevator dropped, the familiar panic began to climb up my skin like a blanket of spiders.

There was a new flavor to it this time, beyond the sense of being crushed inside the Moon. I felt what was surely the oily tide of PTSD. Maybe I should have expected it. I was no soldier; the most stress I'd ever felt was a tight deadline for a grant application, and Alex's sudden violence had introduced me to fragile places in my psyche that I'd never known existed. The only person I shared this with was Annika. We'd been sleeping together for the past three weeks, and she put her own job at risk by keeping my nightmares a bedroom secret. When I was awake, a cocktail of anxiolytics kept my personal boogeyman locked in a dark basement. But now I could hear that basement door shudder and creak. If I couldn't hold it together, the site commander would send me home and I'd never see the iris again. Maybe that's what I wanted.

"You gonna be okay?" Annika asked. She meant would I be okay walking through the passageway where Alex had waited for me; I hadn't been to the lab since the attack. "Look at me, James. Look at me." I shuffled my feet, turned, met her eyes, tried to smile. She spotted the quivering muscle in my jaw.

"Goddamnit." She rushed up, grabbed my arms. Annika had a good four inches on me, wore five kilos of body armor and an assault pistol. I expected her to throw me against the wall. Instead, she kissed me, lips gentle as flower petals, as the readout over the door cycled past

1500. She held me then, and I put my arms around her. “I’m okay, really,” I said. “Just stay close. That’ll help. Okay?”

She pulled away, eyes probing my face, looking for the man she knew, or thought she knew. I tried to smile. Even without pain it was an empty expression, reflecting the vacancy of someone hollowed out by too much strange.

#

For over one hundred years, the Moon had been dotted with research stations, mines, resorts, and universities representing nearly thirty nations. With the right engineering package and smart nanotech, one landing could grow a cozy habitat in under six months. Time lapse footage of this trick never got old. The domes, towers and solar farms sprouted like mushrooms, which they sometimes resembled. Subsurface runners, like mycelia from the central matter compiler, would suddenly burst into view fifty yards from the landing site, flowering into antennae, control centers and airlocks. The runners left tunnels behind to connect outlying chambers with rooms near the core. The technology for creating such habitats was now so mature that anyone willing to make the investment could have one. A score of billionaires had done just that. It was hard to beat the bragging rights. Starscapes surpassing a clear night on Everest, sex at one-sixth g, martinis by Earthlight.

This being a human enterprise, we also brought along baggage that would have been better left at home. It was tacitly accepted that about one quarter of all lunar sites had defense applications. No one could verify this, and every nation denied having any military presence at all. But there were enough whispers and winks at aerospace conferences to make the figure seem, if anything, too conservative. I knew with certainty of only one lunar military site, since its personnel had facilitated my arrival.

Two years ago, during the remote and largely automated construction of a French university annex in Lacus Mortis, a tunneling bot had encountered a diagonal shaft of shattered basalt mixed with regolith, about 40 meters below the surface. This novelty caused the on-site AI to phone home, and within two days the project managers had learned a few interesting things. The shaft descended at an angle of 42 degrees. It originated at the center of nearby Burg crater, and terminated just over a kilometer to the southeast, 2,000 meters down. The French had a schedule to keep, and the matter would have ended there, had not one scan revealed a heat source at the deep end of the shaft; something was maintaining a temperature of about 30

degrees Celsius. This was, to use the phrase echoed by every news service in the system, scientifically impossible. So, the French engineers performed a new thermal scan at higher resolution, and ran the data through some aggressive noise reduction software. This revealed a complex, irregular shape: lobes and branches extending from a central point, almost like flower petals. The image analyst rendered the data in false-color shades of cobalt and sapphire. Someone said it looked like an iris in full bloom. The name stuck.

If the French had ever wanted more friends, they would have been delighted with the next few weeks. Everyone wanted in. There was no human staff at the French site, so the Earthside project leaders were interviewed endlessly. The discovery spawned hundreds of dedicated web channels, and Le Mystère Lunaire became a catchphrase. But why all the fuss? Every geologist said the same thing: it's a lump of uranium, highly unusual, but, well, what else could it be?

#

"Here he is, here he is! Jimmy boy!" Tito strode up as I stepped out of the elevator, his dark face flashing a demon grin, arms about to embrace me. Annika held out an arm like a turnstile and Tito pulled up short. "Shit," he said, raising both arms like a man surrendering. "Sorry, sorry. How the hell is it? Can you cut up your tofu, at least? Play the violin? Wipe your ass? How are you?" Tito was the excavation science lead a good friend.

"I'm good. And I wipe with my right hand," I said. Annika smiled and patted my back like a proud parent. I willed myself to breath slow and deep, but points of sweat still clung to my face. Not forty feet down the passage to my right was the doorway where Alex had waited, scraping a final message into his forearm with a masonry nail. A lot of people on Earth were still trying to understand what "100NI" had meant to a scientist suddenly overcome by a taste for murder.

"Just really glad to be back," I said. "I've been bored to shit. Wish they'd let the French finish their campus. Then I could've been recuperating at Le Bistro, sipping wine and leering at co-eds." My laugh sounded ghastly, like a talking doll. I wasn't sure if they could see the shape I was in; maybe I was putting on a decent act, because everyone cracked up like this was the funniest line ever. "Not to worry!" said Tito. "Plenty of people to leer at right here. Leer at Pilar, she's a vision! Or Jerry!" More cackles, and I tried to join in.

The rest of the team had gathered around. It was a small group, mostly to simplify

security. Jerry ran operations, keeping an eye on CO2, pressure, power, all the essentials of any lunar habitat. Pilar was our research assistant, Stanford PhD in physics and an expert in mathematical modeling. Olivia was a language expert. She didn't speak many, but had invented three new ones as a graduate student, one of which was based entirely on color. We all wondered why she was there. At the time there was no one to talk to other than ourselves, though the implications were unnerving. But she was a great kid and brought an endearing post-doc eagerness to the team.

Standing at a distance were the two dead men, Patrick and Curtis, both US Army Rangers. Each was implanted with tech that monitored cardiac and neural activity, and networked constantly with the level's sterilization module (we were asked not to call it a self-destruct package). It was a single-stage nuke the size of a shoebox. If the module lost both men's life signs within ten minutes, its detonation would vaporize the entire lab, everything in it, and a substantial part of the Moon; the US military liked thoroughness. Some on the team, including me, had initially balked at this feature, and a few early candidates had walked away. Those who stayed didn't like it either, but the allure of being the first to study the greatest scientific mystery since Galileo outweighed any possible risk. As for the dead men themselves, Patrick and Curtis were both combat vets and seemed to have no issues at all with their grim duty. It was no worse, and in many ways a lot better, than some of their past missions. Their stories about Seattle were hard to hear.

"You been reading the reports?" Tito said. "All up to date?"

"It's down to 41.6 kilos, as of yesterday," I said.

Tito's face shifted into an expression I'd never seen, some twitchy emotional crossroads I couldn't read.

"Down to 39.8 half an hour ago." His eyebrows flashed up and down, once. This simple gesture somehow conveyed a depth of uncertainty no scientist wants to feel, stalwart curiosity giving way to growing fear. It made me want to run.

If anything was keeping the team awake at night, this was it. About three months ago, we realized the iris was losing mass. The original value had been determined months ago using a laser cantilever the size of a mosquito. At that time, the iris massed at 72.378 kilograms. The value was noted and we moved on to other things. No one bothered to check it again. Who would? How could an object sealed in a rock chamber colder than liquid oxygen change its

mass? It was only when Pilar noticed a distinctive bit of rock behind the iris, never before visible, that we realized what was happening. The iris was slowly shrinking.

"About a kilo a day," I said.

Tito nodded, all trace of his smile gone. "Right now; but it's accelerating." I suddenly felt very tired, and rubbed my eyes. Annika put her hand on my shoulder. Curtis, with classic Army pragmatism, spoke into the silence.

"Coffee's fresh, Jimmy. See you in the back." With a wave, Curtis and Patrick headed toward the main lab.

I turned to Tito. "Coffee'd be great." We all started walking after Curtis and Patrick. The cheerful mood that had greeted my arrival shifted into a grim sense of purpose. We suddenly seemed less like scientists, and more like the crew of a missile silo in some old movie, hands poised over buttons, waiting for a launch order. I forced myself to look into the doorway where Alex had waited. I could almost see him there, crouched on the floor, tracking my eyes as I passed, silently begging me to understand. I imagined his arm, the crude, bloody scratches. I turned away, kept walking and reached for Annika's hand.

#

Getting the first look at the iris would have been impossible without smart nanotech. While the project was still under French supervision, experts in Strasbourg grew a colony similar to those used for geological research on Earth, but geared for vacuum and extreme cold. Consisting of some 500 million individual probes smaller than bacteria, the colony created a borehole the diameter of a pencil, disintegrating its way down to the iris at two meters a second. After reaching the necessary depth, the probes began to multiply. They opened a chamber directly under the iris, three times the volume needed to contain it. When this chambre de réception was ready, part of the colony formed into imaging, lighting, sampling and transmission hardware, while the rest assembled as a layer of microscopic diggers to eat away the material at the top. The idea was simply to remove all the supporting rock, undermining the iris until it dropped into the void below.

The plan worked perfectly. Engineers on the surface monitored progress using a laser link aimed up the borehole. There was no mistaking the first glimpse of the iris, a startling, glossy material that gradually emerged from of the grey basalt. It appeared dead black in visible light, glaring white in infrared, and a brilliant, luminous blue-green in ultraviolet. As the nano

machines chewed away more rock, it became clear that the iris really had no particular shape. It resembled an old, lumpy tree root, gnarled and twisted, the result, experts said, of a molten impact. It must have struck the Moon like an armor-piercing shell, a slug of white-hot material that shed its heat as it traveled downward, finally solidifying in this irregular mass.

Within days, the gradually revealed underside of the iris became a visual meme. You could find it wherever there were people, on clothing, buildings, landscapes and media screens of every size. On Earth, tattoos were especially popular. Patrons returned to their favorite inkers again and again to have the image expanded as more of the iris's surface became visible.

Eventually, the engineers could see that only a few thin ledges of rock still held the object in place. The moment of seeing it drop into the chamber, at last fully revealed, was anticipated like the first Mars landing. For some time, everyone had acknowledged that it wasn't uranium. No one had the faintest idea what it was.

When the last bit of rock gave way, people on three worlds watched as the iris dropped into the chamber and then stopped, hovering in empty space. It turned and pitched slightly, as if orienting itself to some point of reference. It then became fluid. The gnarled tree root smoothly contracted into a perfect sphere, cameras and lights reflected on its glassy surface. It hung there in the chamber, unsupported.

It takes something extraordinary to silence those whose calling it is to describe what millions of people are watching. Of the legions who faced live microphones at that moment, on news, science, and entertainment feeds, no one said a word. There was a profound sense of the entire human race holding its breath. Though faintly, in the background on one channel, an unidentified voice expressed what many were thinking. "God help us."

It took only a few minutes for a previously unknown American military outpost near Atlas crater to beam a narrowcast message to the engineers at Lacus Mortis. At the same moment, all transmissions from the French site ceased. On public media channels, the US government announced that it had assumed responsibility for the site in the interests of containing a potentially hostile threat. Though phrased in polite, diplomatic language, their meaning was clear: we're coming over, don't get in our way. The French expressed righteous outrage, but when the American rovers appeared on the horizon no one tried to stop them.

#

A year ago, I had just turned 32. My once brilliant star as a materials scientist had already

dipped below the horizon. I was divorced, in debt, and very likely facing a lifetime teaching indifferent teenagers at a third-tier university. An interminable piece of research in microstructural properties was keeping me in grant money, but I was spending most of my time on what was then considered a fringe area: bio-metallic structures. At engineering conferences, it was the sort of thing you only mentioned during cocktail hour, and then only to good friends. I had authored two papers on the subject, both unpublished and safely encrypted in a cloud folder. I would be the first to admit that they had a certain Alice in Wonderland quality, lots of intriguing speculation, little data. But someone had read them. I don't know how. The Defense Department agent who arrived to collect me didn't know. A few hours later I was on a military shuttle, the first leg of a trip to the Moon.

What was happening to me was extraordinary, privileged, and I knew that. I tried to connect with a sense of excitement, anticipating the work, and yes, the wonders that might lie ahead. Instead, I felt waves of vertigo through most of the trip, and a growing sense of dread as the Earth shrank on the viewscreens. It's almost beyond human experience to encounter something completely unknown. Most scientists live for this sort of opportunity. I just felt afraid.

#

From the very beginning, Alex and I were asked to answer one simple question: was it safe to bring the iris to Earth? That was always the goal, to have it within US borders, deep inside some hardened lab where it could be studied at leisure, and its secrets explored for the national good. It was tacitly understood that this probably meant weaponized, though no one ever stated the fact so bluntly.

Our on-site habitat had been designed with such concerns in mind. US Military Engineers injected five additional nano colonies under the surface about 75 meters west of the original bore, spaced 10 meters apart. Each colony immediately began working its way down to the level of the iris. They multiplied, following programed instructions to disintegrate, burrow, fuse, and otherwise assemble the necessary passageways, work rooms, living areas, even furniture. The nano machines were obedient and versatile servants, and needed only supplementary elements to carry out certain acts of creation.

The finished habitat was just over 600 square meters, its east wall separated from the iris chamber by 10 meters of solid rock. If we concluded that the iris was harmless, the nano colonies would remove that barrier and the iris would be brought into the main lab, then up to

the surface. All of this, of course, under the highest possible security. Jammers rendered local lunar communications impossible for anyone lacking the Army's decryption key.

Even 10 meters of rock didn't seem like enough separation between me and that ball of other, but the lab was comfortable enough. It called to mind a polar research station on Earth, and offered private bedrooms, an adequate galley, media room, and next year's most advanced test instruments for mass spectroscopy, data modeling, and every imaging technology known to science. Lots of toys, and we used them all to play our own private game. We called it One of Four.

Was the iris an object, a tool, a critter, or a being? If it was an object, then it was just a rock, a natural though exotic form of matter. If it was a tool, then it was unnatural, a product of intelligence, yet still inanimate. (Though it had a purpose. And what might that be?) If it was a critter, the issue became both more interesting and more troubling. This meant the iris was alive, which suggested any number of possible actions it might take, and dozens more questions. Did it carry disease? Would it reproduce? Would it defend itself? Was it mobile? Was it hungry? And if the iris was a being, that meant consciousness, and we were sitting on the storied First Contact with alien intelligence. Given the iris's supremely unearthly character, no one liked this option at all.

#

It looked so ordinary on the screens. We might have been examining a billiard ball, or some sort of minimalist artwork lovingly shaped from a chunk of obsidian. The six camera views were available at every console in the lab, and we just stared. There was no sense of what to do next.

Watching the steam rise from my coffee, I noticed the quiet. Before Alex's attack, there had always been music in the lab; we took turns setting the day's playlist. It made the place feel more human, less remote. Tito's 18th century classical would lead into Patrick's Western swing, perhaps then into my own 1970s fusion or Pilar's Colombian vallenato. But no music today, and I had a feeling there hadn't been any for a while. The lab was quiet enough to hear breathing, shuffling feet, the rumble of a sour stomach. I glanced at Annika, leaning back against the stone wall in the right front corner. I gave a little questioning shrug, which she returned with a cocked eyebrow, a challenging look, as if to say, you're the new boss, boss.

She was right.

"Hey Patrick, how about some of those Texas Playboys?" I said. Everyone in the room seemed to relax ever so slightly. Pilar smiled at me. Tito nodded. "I won't say no," Patrick said, reaching for a control panel. A moment later, the sparkling fiddle, mandolin and guitars of Bob Wills and company drifted from a dozen speakers. And so help me, at that moment I felt an almost physical surge of confidence, a flood of optimism that soothed like a hot shower. I was sure we would figure it all out. I dropped into a chair at the main observation console. There seemed only one thing to say.

"One of Four."

Everyone sat, spun their chairs to face me.

"It's a critter," Pilar said. "It's getting smaller because it's propagating. It was waiting for a pathway to the surface, and the borehole provided one."

"Surface can't detect anything coming out of the borehole," Tito said. "We've been over this. And the borehole was open for months before it started losing mass."

Jerry said, "We're not sure when it started losing mass."

Pilar was undaunted. "Maybe it just took that long to come out of a dormant state, which may have lasted for hundreds of millions of years..."

"...nothing can live that long," Tito said. "Thermodynamics..."

"...or we simply have not found it yet. And it may be releasing material a molecule at a time. We've been over that too. The surface sensors don't detect anything smaller than one micron. Why haven't they upgraded the sensors? We asked for that weeks ago."

"If it's a critter, you should think about replacing me with a biologist," Olivia said. "I'm pretty sure conversation isn't on the agenda."

"I hope to Christ you're right," Curtis said. "My boss thinks about that, she gets real twitchy."

"Come on, you're all reaching," Tito said. "It's an object. Utterly new, incredibly fucking strange, but still just an object. We all know a lot of weird shit comes out of a supernova. This is some new element from some huge mother nova. And it may be a very long time before we understand it. That still doesn't make it more than a rock."

"Why is it getting smaller?" Jerry said.

"Unknown." Tito said. "That's science. Things take time."

"Maybe it came out of a black hole," Jerry said.

"Uh, I won't say that's impossible," Tito said.

"Alternate universe?" Olivia said.

Tito looked glum. "God, I hope not. Can't publish with that."

"Any votes for tool?" I asked.

"Tools have a function," Jerry said. "What does it do?"

"It made an extremely deep hole in the Moon," Olivia said.

People tapped on coffee mugs, doodled on tablets.

"It's been very good at waiting. Waiting for a long time," Annika said.

We all turned to look at her, leaning against the front wall. Annika was a new face, and the old team members seemed not to welcome her participation. She looked at me. "Isn't waiting a function?"

"Timing is," Tito said. "Measuring elapsed time, or time remaining. Like a countdown."

"Independence Day!" Patrick said. "Great. We sure there's only one of these?"

"No," Tito said.

Not a single conclusion, disagreements growing more heated, but it felt so good to be talking, to be working again. We spitballed ideas for another half hour, then Tito left to make our morning report to Earth. I asked Pilar to create some new 3D graphic plots of the iris's decreasing mass, to see if the slope of change suggested anything similar to known changes in nature. I put Olivia on a linguistic wild goose chase--predicting the thought processes of a life form that was virtually immortal--but it was better than sitting around. Jerry returned to his never-ending survey and adjustment of our habitat's operational integrity. The dead men went to the media room to watch Independence Day.

I leaned back in my chair, a fresh cup of coffee in hand, and stared at the wall of rock that separated us from the greatest enigma in human history. I realized I hadn't thought of Alex or my shoulder or where I was for nearly an hour. And if that was the only positive thing to happen this day, it was entirely fine with me. I blew Annika a kiss. She caught it like an outfielder, licked her palm, and blew one back. We both smiled.

#

Shortly after turning 27, I finished my dissertation at UC Berkeley, put my personal and academic detritus in storage, and flew to New York to spend a week with my father. The house where I'd grown up, a tidy, brick fronted Cape Cod near Tarrytown, was now the crumbling

manifestation of a broken life. From the window of my airport rental, I could barely see the front door through the jungle of weeds, vines, and shrubs gone feral.

My father had been a computer scientist and did contract work for the aerospace industry. Early in life he had enjoyed moments of brilliance, and a key algorithm still used in network design bore his name. But when he turned 50, not long after my parents divorced, something in his brain pushed him across a perilous behavioral threshold. He began printing every email he received, even the junk, and filed the pages in rusty metal cabinets that crowded his living room like standing stones. He attached small paper labels to everything in the house, describing each item's date and place of acquisition. Multiplying compulsions eventually left him no time for work. He lost all his contracts, and finally reached a point where he never left the house.

Even before this sad downward spiral we hadn't been close, and I clung to a resentment that I had nurtured since high school. My father failed to express pride in anything I achieved, and as a young PhD I felt I deserved more. For over a decade any love I might have felt for him had been tinged with anger. But as the paths of his life became fewer and narrower, that anger gave way to dread. I wondered if my own mind would someday tumble down the same rabbit hole, becoming lost in meaningless obsessions.

We had last spoken just two days ago.

He knew I was coming, so I let myself in. But as I entered the front hall, a sudden whiff of decomposition nailed me to the floor. I should have just returned to my car and called the police. I knew what had happened, beyond any doubt.

"Dad? It's me." I could hear the air conditioning running, and the mumble of a MediaPal from some other part of the house. I took out my phone, but only held it at my side like a drawn pistol. I stepped through the kitchen, crossed the living room, and turned down a short hallway that led to the bedrooms. The larger one to the left was his office, and the door was closed.

I turned the knob and pushed, encountering the resistance of a heavy weight. Any remaining doubt vanished. I pushed the door farther, and the smell of death rolled out like a sticky cloud.

He had hung himself from the office door using an ancient length of 50-conductor cable, the kind used in electronic control systems a century earlier. Obsolete cable was the sort of thing he collected. Pinned to his shirt was a note in my father's hand, written in pencil. SEE YOU SOON.

I waited outside for the police. It was all very businesslike, efficient and respectful. Four hours later, after a van had carried away a featureless black body bag, it was easy to imagine the entire experience had been a dream. I tried to reach my mother, but only connected with voice mail. I called my sisters, my aunt, two cousins I'd never met; no one answered. I wasn't surprised. Our world had become one in which voice communication had to be scheduled.

Years later, packing for my sudden trip to the Moon, I came across my father's note. I had stuffed it in a pocket after finding the body, and never mentioned it to anyone. At least once a day, I wondered what he actually meant. Was it an invitation? A prediction? This had grown into an even greater fear, worse than my nightmares of having to touch doorknobs seven times before turning. Suicide was a gaping, absolute declaration of failure, a surrender to chaos. I had no religious faith, believed in no afterlife. But my nightmares carried the taste of utter hopelessness that would make a bullet, a noose, or a bottle of pills seem like salvation.

#

The fevers began two days later.

Our site had no medical personnel, but boasted a Stryker AutoDoc that could perform anything short of major surgery. Each of us knew the implications of an unexpected illness, so, like teenagers trying to hide a midnight tryst, one by one we slipped into the AutoDoc's alcove to run our own diagnostics. That is, everyone but me.

Any attempts at secrecy were pointless; the AutoDoc discretely alerted medical teams on the surface and on Earth. After the first person, Annika, revealed a body temperature over 100, our unseen minders implemented the quarantine protocol covered in appendix IV of our project plan.

Surface operations disabled the elevator and emergency evac tube, then downloaded a special medical diagnostic routine. All of us were ordered to sit patiently while the AutoDoc poked, scanned, drew blood, and asked hundreds of qualitative questions. "Compared with your condition two days ago, is your thinking very clear, somewhat clear, somewhat confused, very confused, or you're not sure?" No one tested positive for any known pathogen, yet all the others displayed signs of a raging infection: fever, elevated white count, systemic inflammation, severe myalgia. I remained stubbornly asymptomatic, presumably because I had spent most of the last month on the surface. This fact alone was suggestive. Whatever was beginning to battle for our cellular real estate, it was something that existed in the lab and caused greater toxicity with

longer exposure. Some of the others tossed me envious looks, but my immune system was no better than theirs. I felt helpless, standing on the tracks facing an oncoming train of disease.

Annika was an even greater mystery. She was the first to develop symptoms, yet had spent less time in the lab than anyone.

For all the AutoDoc's sophistication, its diagnostics were based on known antigens; the unknown was precisely that. We speculated on contamination in the food, air, water, or maybe some sort of mold that could have snuck in on packing material or clothing. Tito was adamant that it wasn't an infection at all, but rather a severe inflammatory response to some material in our environment. No one ventured any comments about the big piece of unknown sitting near the lab behind ten meters of rock.

The others grew more ill by the hour. When our normal dinner break arrived, they were running fevers of 102 or higher, and one by one they stumbled off to bed. The AutoDoc prescribed aspirin, rest, and hydration. It also deployed small medical drones, which trotted after each of us like faithful terriers. The drones could extend probes to monitor vital signs and would be the first to know if anyone died in their sleep.

I stayed in the lab. I scanned the nets, reading about the lethality of severe fever, quirks of the immune system, quarantine procedures, the creation of a legal will, very much aware that my every action was now being watched by the surface team. I knew that, as far as the people in charge were concerned, I had stopped being a scientist and was now just a rat in a box. My own medical drone crouched on the floor next to me, its probe resting on my ankle. I was happy to have its company.

"How'm I doing?" I asked.

It replied with a crisp, genderless voice, somehow managing to project empathy, a sense of concern. "Your temperature is normal. Your heart rate is elevated but within safe limits."

"Good to know. Thanks."

I walked to the front of the lab, stood inches from the smooth rock surface, picturing the shrinking ball of mystery that lay so close. The drone followed like a faithful pup. I tried to project my will through the rock.

"What are you doing?" I asked the wall.

The drone said, "I must remain close to monitor your condition."

"I didn't mean you."

"Your temperature has risen 0.2 degrees Fahrenheit."

I sighed. "Here we go."

In my room, I found Annika sprawled naked on the foam slab, barely covered by a sheet. She was asleep, or comatose. I rested my hand on her back. Her flesh was on fire, as if she were lying in Death Valley at noon. I undressed, swallowed aspirin and half a liter of water. I was beginning to sweat, felt the first stabs of pain in my muscles, a sudden chill. I lowered myself slowly to the bed, crowding away from Annika, hoping for the refuge of simple dreams. The drone hopped up to crouch beside me, placing its probe on my thigh.

"Getting a little familiar there, kiddo."

"I must monitor your condition," it said.

Half an hour later, sleep seemed unlikely. Moving had become agony, yet lying in one place felt like being slow roasted. For a while, as I lay on my back, eyes closed, I believed I could hear odd scraping and rustling sounds, as if a cat were padding across the floor, the walls, the ceiling. My skin felt sudden moments of itching, which moved from arm to leg, face to chest. Maybe Tito was right, and we were all reacting to some elusive allergen. I ran a mental checklist of all the items in my room--and then I was in my father's house. There was no segue at all between consciousness and dream. I felt a crushing sense of purpose, a terrible urgency to find him, and jumped from room to room without walking. My father's filing cabinets now overflowed. Teetering stacks of paper stood on the floor, impossibly canted, like something from Dr. Seuss.

A sound of movement down the hall, near my father's office, and then I was there. His desk was piled high with more absurd stacks of papers and books, bent over like drooping trees. I whirled around, expecting to see his body hanging from the door, but instead it was Alex who stood behind me, smiling, dressed in the professorial sport jacket he'd worn when we first met. I backed away from him.

"Don't you get it, Jim?" he said.

I couldn't speak. He stared at me, looking a bit unhappy, like a disappointed mentor. "How about I show you again." Now his jacket was gone; the left sleeve on his blue oxford button-down was stained a brownish red along the forearm. He loosened the cuff, pulled the sleeve back with a sound like tearing leather, and showed me his final message. The wounds were scabbed over, the flesh black with necrosis, but as I watched the cuts split open and fresh

blood welled out, dripping to the floor, precisely spelling out the same five characters. There was one change. What took shape on the floor of my father's dream office, drop by bloody drop, wasn't 100NI, but 100NM.

"That shed a little light on the subject?" Alex said.

I awoke on the floor next to my bed, the drone crouching at my side. I had fallen onto my face. My nose felt broken, was certainly bleeding. But I had returned from sleep with something vital.

The drone asked, "Are you okay? Should I summon medical assistance?"

"No," I gasped. "And there isn't any." We were all wrong. Alex's final message would have been clear to most of us, but he hadn't finished it, had only completed the first stroke of the M. Twisting onto my side, I spoke my new truth to the room: "One hundred nanometers." This was the wavelength of ultraviolet light used in our early observations of the iris.

I shifted onto my knees and my head seemed to expand. My body was a single rippling ache. I was shivering so violently I could barely stand, muscles twitching like broken toys. "Returning to bed is a good idea," the drone observed. I levered myself up, sat on the bed. Whatever had invaded our bodies was almost certainly going to kill us, yet I wanted to stay alive long enough to learn its secrets. The shivering made it hard to do anything with my hands, but I managed to drag on coveralls, stuff my feet into slippers. I drank some water, wobbled to my feet and took a step towards the door.

"Jimmy," came from somewhere behind me. I turned, glanced down at Annika. She hadn't moved; her back rose and fell smoothly with each breath.

I rubbed my face, turned and stumbled. Blacking out was a real possibility. There was nothing to use as a cane, so while walking to the lab I hugged the wall, kept both hands on the nano-smooth rock, moving like a climber on a mountain ledge. The drone walked faithfully by my side. A new voice spoke from it. "Jim, this is doctor Fredrickson. Your temperature is 104 and climbing. You need to get back to bed. You are in no shape, hear me? No shape at all to be doing anything. Please go back to bed."

Fredrickson had been on the medical team that treated me after Alex's attack. Nice guy. "Jim, do you hear me?"

"Something I gotta do, doctor," I said. "You watch. This could be real interesting. Could be a real eye opener." There was no part of the lab not covered by cameras. What I was about to

do would be seen very clearly, from about six angles.

I passed Alex in the hallway, once again sporting a natty tweed jacket. He clapped his hands in mock applause, nodding and smiling. I grinned back. Having his approval made me extraordinarily happy.

I shuffled into the lab. Motion sensors activated the lights. Alex now stood near the front wall, by the main screens. He waved an arm gracefully, as if ushering a new guest into a hotel suite. I stumbled into the nearest chair; it was Pilar's console, decorated with post cards from Colombia and pictures of her family. Her sister waved at me and smiled.

I leaned forward to let the system scan my face. "James Carlin Donahue, logging in." I was trembling, and my face might have been blurred, but the system was happy. A familiar series of tones confirmed my access. The six iris cameras were always on, so I only had to activate the lab screens and switch them to the right input. A moment later I was looking at the iris floating in its rocky lair; a text overlay at the bottom of the screen displayed date, time, and updates on sensor input, including the object's mass.

The iris had shrunk to 9.241 kilograms. It was now about the size of a grapefruit, still jet black and motionless, but it had taken on a distinct egg-shape, small end down. I just stared, feeling like the entire universe might at any moment begin to slip away, tipping over some event horizon that was just out of sight.

The medical drone trotted up, placed a bottle of water and a packet of aspirin at my elbow, then extended its probe to rest on my ankle. Doctor Fredrickson spoke again. "What are you doing, Jim?"

"Hoping I’m wrong."

Documenting the iris under spectra other than visible light had been part of the first phase of our research. Like measuring its mass, this wasn't something we thought needed repeating. As this crossed my mind, Alex chuckled from a nearby chair. I laughed with him, acknowledging our foolish arrogance.

I found the right interface and switched the lighting in the iris chamber to ultraviolet, exactly one hundred nanometers. Glancing back to the screens, I beheld wonders.

As expected, the iris glowed a brilliant blue-green. But now it seemed to be cradled in a nest of hair-fine tendrils, thousands of filaments so thin they appeared more like a cloud than individual strands. Yet the iris was self-supporting; it wasn't resting on these filaments, it had

extended them. They were like lines of dutiful ants leaving a colony, pursuing important business elsewhere.

A new voice was speaking, but I was having trouble listening. The headache punched angry red flashes into my vision, and my skull felt crushed by every meter of rock between me and the surface. There were frightened, urgent words: "How did you know to turn on the UV? Have you been holding something back? What else haven't you reported? Answer me, goddamn it!" I placed the voice; it was Colonel Angela Conover, the site commander. "Donahue, can you hear me? How the fuck did you know?"

"Alex told me," I said. "He saw it weeks ago." I heard indistinct shouting from the surface, cursing, then silence. The drone said, "Water will help you feel better." Good advice. I opened the bottle, took a long drink, tried to breath deep. Good drone.

And then I was pulling open an equipment locker at the back of the lab, still sitting in Pilar's chair. I didn't remember rolling it over there. What I wanted was on the second shelf: an Alternate Light Source. The size of a big flashlight, the ALS could emit any wavelength from long infrared to short ultraviolet. It was on hand mostly to locate small amounts of lunar regolith, which could play havoc with our equipment. I recalled Annika telling me it was found on Alex's console after a security team combed through the habitat, pulling his life apart.

I dropped the ALS in my lap, then used my feet and hands to roll my way to the front of the lab, gripping desktops and equipment racks. The drone paced alongside. Finally, I was a few feet from the blank wall that lay between me and the iris. Ten meters of solid rock, the length of a nice vacation cabin, or a vegetable garden, or about four graves.

"Lights off," I said. The room dimmed to the glow of data screens and safety lamps. I set the ALS for one hundred nanometers, aimed it at the wall and flicked it on.

Oh.

The next few moments seemed choreographed by a brash, hyperactive film director, eagerly creating the kind of montage that was so popular in Hollywood thrillers a century ago. My face goes slack, I look left--CUT--the ALS slips from my hand--CUT--my eyes follow the pool of illumination down the wall--CUT --the ALS strikes the floor, bounces, spins out of frame in slowmo--CUT--I slump forward, falling from the chair--CUT--my face hits the floor--CUT--the chair rolls away behind me, disappearing into shadow.

DISSOLVE. I'm drifting down the hallway, somehow without walking. I realize I'm

being carried. Pan over to my left to see the good and faithful drone. It's barking with angry, panicked voices I can't understand. I see a flash, like heat lightning. My vision loses color, then begins to contract into an uneven tunnel of flat, grey blurs. Fade to black.

#

I opened my eyes to a field of stars, tiny points that glittered as I shifted my head. Fuzzy stars. I smelled blood, sickness, sweat, Annika's distinctive musk. I was in my room. I rubbed my eyes, and the stars resolved into flecks of pyroxene in the ceiling. I groped for Annika, found that I was alone on the bed; but the lavatory door was ajar, the light on inside. I tried to call her name and choked, my throat like a plug of sawdust. I remembered water nearby, rolled my head to the left. The drone lay next to me, asleep to conserve its charge. I lifted a bottle of water lying next to it, raised myself on one elbow and drank deep.

"Jimmy," from off to my right. My father's voice, spawned by helpless delirium. "Jimmy, I'm so proud of you. Do you know that? I just wanted to say that." I turned to the right. My father's face emerged from the wall at the level of the bed, resembling a mask hung for display. It seemed to have grown out of the rock; there was no visible seam, and his face matched the color and texture of the stone. The eyes blinked, the mouth smiled, and he seemed to wait for my response.

A tide of vertigo made me groan, and I fought back the impulse to vomit. I blinked furiously, rubbed my eyes harder. The face didn't go away. My father smiled. "How ya feeling?"

I could only grunt, but I tried to scream. "ANNIKA..."

The lavatory door slid open and she stepped out. She was still naked, which suggested a certain pride in her transformation. Her hair, eyes and entire body were jet black, the color of the iris. She had a glossy appearance, less like skin, more like a sculpture of dark stone polished to molecular smoothness. And with a series of flashes I remembered her habitual position in the lab, leaning against the front wall. She liked the feel of the cool, nanosmooth stone on her face.

Annika glided onto the bed, pulled me to a sitting position, held water for me to drink. "Don't try to talk, James. You're really sick. Here, drink. Good. You'll be okay." She sounded stoned, not at all the whip-quick soldier I remembered. I lay against her, shaking, my cheek resting on an obsidian shoulder. Her skin was warm, inhumanly smooth, slightly yielding. "I've been talking to your father," she said. "You never told me he killed himself. That's so sad, James."

The steady machinery of consciousness that had kept me oriented and functioning up to now was stripping gears, burning out bearings, about to seize up. I wanted, needed to pass out, to let hours or days drift away so this impossible trip could just stop.

I took the water bottle in a shaking hand and drained it. Annika offered a warm smile. "Better?"

"Yeah," I said. "Thanks." I turned to my not-father on the wall. "My father is dead. On Earth. So who the fuck are you?"

"Good question." The face melted back into the wall, leaving not a mark, then reappeared on the adjacent wall, over the bed, much closer. Whatever had created this apparition had reproduced his face down to the beard stubble and a mole I remembered under his left eye. "I think I'm you, Jimmy. I'm what you remember. Some kind of test. To see how deep we can go. Biology first. Then memory. Then control. See, you people can take us places. That make sense?"

Take us places. That innocent little phrase seemed to echo around the room.

"I like your dad, James," Annika said. "We had a good talk."

Moving made me feel like I had veins full of broken glass, but I managed to get my legs over the side of the bed. My hands showed darkened patches, areas of too-smooth skin. I turned to face Annika. "Do you see what's happened to you?"

She looked puzzled. "Sure. We've changed."

We.

So it wasn't an infection, not really. It was more like an infiltration, a process carried out by an occupier with means and motives beyond human conception, as alien as chromium blood.

We finally had our answer to One-of-Four.

Bringing the iris to Earth was not safe.

Neither was leaving it on the Moon.

Alex understood. He hadn't been aiming for me at all. He'd been trying to kill Curtis. If he'd succeeded, his next step would have been firing a few masonry nails through Patrick. Alex may have lacked a soldier's tactical sense, but he had a scientist's respect for data, even when it told a terrible story. That’s something we shared. So now I would get to commit mass murder and suicide on the same day.

Annika's assault pistol would make this easy, but only she could fire it. I tried to think of

something sharp, pointed, but there wasn't a single knife in our tiny galley. There were syringes in a cabinet near the AutoDoc, so I considered trying to inject 20 cc's of air into a major vein, but my hands were shaking too much. And I was too week to snap a neck or crush a hyoid bone. But there were plastic bags in the lab; everywhere people went, they brought plastic bags. It shouldn't take long.

I stood, lurched into the wall. The room swam around me, and my vision flashed purple-white, another approaching blackout.

Annika stretched out on the bed. "James, come and lie down with us." Annika rolled her head towards me. She sounded more awake, alert. I didn't have much time. "We want you, baby."

I forced what I hoped was a sincere smile. "Be right back. Just want to grab something to eat. I'll bring you something, okay? Just wait for me."

"Eat," she said, and rolled her head away. As I stumbled out, my not-father called, “See you soon!” I shut the door before the drone could wake and follow me.

The dead men occupied separate rooms on opposite sides of the habitat. Patrick’s was closest. He hadn't even shed his boots. His medical drone was still active, and glanced at me as I entered. I picked it up, managed to chuck it outside and slam the door before it could scramble back in.

I had found big plastic bags in the galley. I pulled one over Patrick's head, tugged it down to his shoulders, then cinched it around his neck with his belt.

I didn't have long to wait. Colonel Conover's voice exploded from somewhere near the ceiling. "DONAHUE, WHAT THE FUCK ARE YOU DOING TO PATRICK?" I was far beyond explaining. They had seen what I had seen. But bureaucracy, conflicting instructions and simple fear had probably stalled any action. That was okay. I could act for everyone. I found the pulse in Patrick's wrist, and waited. Conover's orders, insults and pleas tumbled on.

Patrick's heart stopped in about two minutes. A distinctive warning tone sounded, one I remembered from mission orientation. Conover screamed, "DONAHUE, WHAT ARE YOU DOING”? Good. I left the bag over his head, just to be sure.

I slid open the door. The drone ran back inside, hopped up onto Patrick's bed and deployed a defibrillator. I didn't think it could make any difference, so I stumbled out and headed for Curtis's room, the other plastic bag loose in my fingers.

As I shuffled down the corridor, Conover screamed from everywhere. "Donahue, at least let us evacuate. There are over 100 people here, we need an hour to get outside the radius. For God's sake, don't do this. You'll kill us all."

"Pretty sure that's a good thing Colonel. You saw it too."

"Saw what?" she said. "The video went dark right after you hit the iris with UV. All we have is audio. What are you talking about?"

I stopped.

They hadn't seen. They had no idea.

The hadn't seen the ALS flick on in my hand as I slumped in Pilar's chair, the stone wall of the lab revealing its secret.

They hadn't seen the entire surface covered with luminous blue-green threads, countless thousands, emanating from a central point opposite the bottom of the iris chamber. It was as if a team of artists had used the finest brushes to paint a mural of fungal mycelia spreading over a forest floor. And I knew that's precisely what they were. The iris had no need to leave its chamber with anything so obvious as a tunnel. It simply shape-shifted into filaments a few molecules thick, which passed through the rock like eels through water. The floor, ceiling, even furniture, all were permeated by the glowing threads. But the surface team hadn't seen.

They hadn't seen the 100 nanometer light spill onto my hand.

My flesh had been gifted with a new system, hair-fine blue-green capillaries of unknown function. The iris was inside me, inside all of us. Seized by the initial shock, I wondered why. If it was a parasite, what was it taking? If it was a symbiote, what was it giving? I'd felt a brief hope that if our bodies could adapt to this invasion, survive the near fatal immune response, maybe there was a chance we could still figure out the science. But the events in my room changed all that. Now I knew why, and what. The iris was a being, perhaps many beings, with ambitions, goals, and places to go.

I slid open the door to Curtis's room. His medical drone stabbed my leg with a syringe, tried to inject something. I yanked my leg away, fell to the floor, kicked the drone out the door and slammed it as numbness began to creep through my calf. I crawled toward Curtis's bed, found his belt, used it to tourniquet my thigh. Colonel Conover still screamed over the intercom, cursing, weeping in helpless rage 2,000 meters above.

I didn't see another belt, so I held the bag around Curtis's neck with my hands. Hail and

farewell. I knew there would be no Hollywood countdown. When Curtis flatlined, it would just happen. All matter in or near the lab would be reduced to its component atoms, and some atoms changed to other elements. My second transformation in two days.

Whatever the drone had injected was getting past the tourniquet; I was feeling weaker, a little groggy.

I wasn't sure how much time had passed, then I realized my hands were aching from holding the bag tight around Curtis's neck. I checked his pulse and couldn't find one.

Nothing had happened.

My mind spun. I wondered if I was having some kind of near- or post-death experience, the nuclear fire having killed me so quickly it didn't register at all. Maybe I was a ghost, damned to haunt some spiritual lunar lab for all time. Then it hit me: the video feed had shut down at a critical moment, and maybe this wasn't a random glitch. Maybe our bodies weren't the only things infiltrated by the strange lunar mycelia. After all, they wanted to see how deep they could go. Maybe the iris had penetrated everything, every system and component, exploring, modifying, transforming. Maybe some vast, inhuman, distributed network was in charge now.

There was music drifting in from outside. I slumped onto Curtis's bed, half in a dream, and turned toward the sound, recognizing one of Pilar's vallenato ballads. I lurched towards the door, slid it open. The music was nightclub loud, thundering down the stone hallway. We had never played music this loud in the lab, and the echoing Latin rhythm, at once happy and sad, seemed too large for the space. The stone corridor might have led to some smoky, sweaty bar in Bogotá, a place full of beer, rum, smiles, and moving bodies. A tenor voice sang of love and loss, of pain and joy and a ship that travels forever.

I entered the lab, the music pounding through my chest. Annika was leaning against Pilar's console, swaying back and forth, keeping the rhythm with her hips. At the end of the verse, she spun on the ball of one foot, saw me and stopped. She smiled a black, glistening smile, reached out in invitation. I smiled back, extended my own obsidian hand. I felt the presence of countless others standing all around me, a family I had never met, cousins without number.

I took Annika in my arms, pulled her close, and we danced. There were so many places I wanted to take her.