

Minuscule
Truths

Short Fictions

J.L. Forrest

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SAPIENCE SIGNIFIED

e made our first studies of Joon at 1,089 kilometers, mean low orbit. The world filled a 160-degree arc in our planet-side viewports, an enormous violet and blue disc capped at its poles by ice. Land constituted fifty percent of Joon's surface, the rest water with only two major seas: one centered on the equator, 3,113 klicks east-west and 3,948 north-south, the other nearer the south pole. Islands freckled Joon, few dominant to any other. Not seven continents but seven hundred thousand islets, a hundred major archipelagos complete with volcanic chains, salt seas thicker than Earth's, pleasant enough weather punctuated with frequent clouds and pummeling rains.

Rain moved across a third of the surface, two hundred million square kilometers of light drizzle to hurricane flood. Joon wasn't Earth: gravity one-point-two standard; oxygen rich, enough that field scientists without rebreathers would feel high as kites, ferrous metals would rust at twice the rate they would back home, and fires burned twice as fiercely; thirty-three trillion mature tree-like organisms. Shortly after arrival we stopped calling them *tree-like* and simply referred to them as *trees*.

ABOVE THE BLUE-WHITE arc of Joon's sky shone two major moons, the ash-gray Orelus and rust-red Corius. Eleven minor moons followed stable orbits, all visible from the ground at some time or another. A cushion of low clouds eased across the sky. Above the firmament the exploration vessel *Curiosity* orbited at 28,000 klicks per standard hour,

but during the day Bilit couldn't see her; at night the ship glistened in the light of Joon's primary star, Piscium.

Renamed Secundus by the team, the secondary star resided nearly 20 AUs away, merely another bright point among the constellations. The two stars orbited one another, so Secundus followed its own arc as seen from the ground, independent of the rest of the universe.

For three months the *Curiosity* studied the system from asynchronous orbit. The crew deployed satellites which established communications, sensor and power arrays, and a defensive net.

We won't need that here, Bilit thought, but the decision to waste payload on defenses had belonged to bureaucrats who were likely long dead.

He stood on a grassy escarpment overlooking a scalloped valley. From edge to edge, trees packed freshwater drainages as densely as in any rainforest on Terra, yet no one could mistake this place for Earth. Every plant, as loosely as *Curiosity's* biologists classified them, leafed in purple shades. A breeze touched Bilit's cheek and the entire forest responded to a rolling north wind. The treetops undulated in faint lavenders and deep violets. Nearby the broad serrated leaves of native trees whispered like any tree on Terra.

Bilit wiped a tear from his eye. He removed his rebreather. For a few moments he breathed the Joonian air, but soon his head swam and he felt made of the air itself. He replaced the rebreather to recover from the oxygen high.

He stood in a plum-colored field which reflected the barest emerald. The majority of Joon's life photosynthesized, plant and animal.

Purple rhodopsin, Bilit thought, not green chlorophyll.

The biologists had not yet determined whether the kingdom *Animalia* could apply to Joon's more mobile and often sentient life. Some so-called animals utilized cellular walls, while others did not; some so-called plants employed proto-muscular structures, but most did not. The boundaries between flora and fauna blurred on Joon—did not, in the strictest sense, even apply.

Bilit kneeled and placed a gloved hand near a tuft of long grasses. They leaned from him.

“Remarkable,” he said.

Bilit travelled with ample protection. A light carbon exoskeleton compensated for Joon's *1.2g*. Nonetheless, he felt the gravity in his internal organs, on his skin and bones. Mission command preferred field scientists keep excursions to four standard hours; Bilit liked fourteen. Yet while the exoskeleton gave him a gorilla's strength, pressure on his lungs and intestines took its toll.

Gravitationally aggravated exhaustion.

Four robotic spiders accompanied Bilit. The eight-legged carbon-titanium AIs followed complex algorithms, but they extended Bilit's body and mind. Their wifi communicated with nanite arrays in Bilit's brain. He felt, touched, heard, and electroreceived through their sensors. They could prompt him to peace or alarm, or allow him to better observe. The spidery sentries needled gracefully over nitrogen-rich exoplanetary soil and through tangled undergrowth.

Bilit stood at the jungle's verge. He left his armored dhopter parked on the grass, the vehicle folded on itself. Bilit stepped into the shadows beneath the canopy.

HE WAS BORN IN the Freestate of Chicago. After an illustrious academic tenure, thirteen years' service in the Terran Science

Corps, two Martian tours, and a Magisterial Honor, Bilit volunteered for the *Curiosity*. He trained with the crew for three years. Six days before *Curiosity* left Earth orbit, the chief medic administered Bilit a fatal dose of sodium thiopental and pancuronium bromide. His heart stopped within seconds.

AS BILIT WALKED THROUGH the southern jungles at Joon's sweltering fortieth parallel, he struggled for scientific objectivity. What wonder! Centuries might pass before ecologists could build a reasonable taxonomy. He saw beauty and all the bases of biological life as they existed on Terra, made breathtakingly different. Life in distinct fractals, colors, and patterns subtly or shockingly unfamiliar; life at a pace quicker.

Here too he found Darwinian laws; everything became food for something else. Creatures filled each niche—bug-like, pests, parasites, herbivores, flesh-eaters, crawlers, swimmers, climbers; the camouflaged, the rapid, the vicious, the cooperative; flyers and gliders; the armed and armored. For the first time, Bilit felt visceral dread that something might prove big enough, fast enough, or aggressive enough to overcome the sentries, to shred his armor, and to eat him. Hydrogen, oxygen, carbon, nitrogen, sulfur, and phosphorous—any flesh-eater on this planet could digest Bilit quite well.

Praying mantises, he thought, hexapodal traits, but not those of Terran insects.

Most Joonian life exhibited no insect-like traits, save for size and niche. Lithe-limbed herbivores or powerful predators, whose back four limbs synchronized tetrapodally, perambulated as efficiently as any jaguar. Many animals, plant-eater and flesh-eater, possessed forelimbs for grasping or cutting, some

with prehensile digits. Animals chased each other through trees or undergrowth. Bilit smiled at the *noise*.

Cries and chirps and chatters. Calls and carols. Growls. Clicks. Animals shook and raised bristles.

He looked closely at these—not mammalian, but something between fur and feathers, hairs which grew smaller hairs. On some organisms it looked worth a cuddle, save many possessed a row of pearlescent, shovel-shaped, razor teeth. Other creatures grew fur in latticed, armored coats. Toothy and tough.

Bilit recorded images and dictated his notes. He collected samples. He drank the splendor that here, two-dozen light years from the mythical Garden of Eden, existed the real thing. It had evolved from its own DNA helix for hundreds of millions of years.

We were never alone, he thought, and twenty-four light years is our next-door neighbor. It's nothing. What abundance the universe must hold!

Next door, but *Curiosity* had needed two hundred years to cross that distance.

SIX MONTHS BEFORE LIFTOFF, the crew underwent treatments. Engineers applied nanites designed to augment biomechanical performance, to supplement active cells, to strengthen bone, to reinforce muscle.

"I thought the idea was to kill this body?" Bilit had asked them.

"We'd like you to get accustomed to high-level augmentation now," they'd replied, "way before you reach the other side."

Artificial neurons sidled to living neurons, mirroring the host's connectome. Too expensive and impractical to ship several hundred living bodies 2.24e+14 kilometers, so the

neural nanites created a continuity of consciousness which allowed the crew to survive death, to sidestep the Lockesian problem of broken identity.

Bilit had signed on without a second thought. *Stars, here I come.*

A PACK (A HERD, a gackle, a troop?) of Labrador-sized omnivores crossed Bilit's path, and he recorded them. His sentries circled him to establish a defensive perimeter, five meters to a side. As prosthetic extensions controlled by his neocortex and amygdala, Bilit trusted the sentries. Their response resembled a first jolt at any startling movement, driven by the amygdala, then rationalized at higher levels.

Scientists had designed the sentry algorithms, not soldiers. They would be slow to violence without some intentionality from Bilit's frontal lobe.

Unless shit got really serious.

The labrivores had evolved hexapodally. They walked on four sturdy limbs, three-toed feet negotiating each step. Hinged claws grew from a bony extension glazed by violet enamel, weapons not at all like Terran chitin. Their short forebody sported prosimian front limbs, ending in prehensile paws—two fingers and one thumb. The labrivores picked through undergrowth, unearthing roots or snatching smaller creatures, spitting out what they disliked. Their brown and violet feathery fur camouflaged them.

Bilit stepped forward. The lead animal stood on its hind legs, its front legs and arms hanging. It faced him, thirty meters distant, and raised its head. Its slender nostrils flared.

The animal squeaked and the troop ran, crashing through the undergrowth, their short-tailed rumps bobbing up and down as they disappeared into the foliage.

Bilit examined the vegetation along their path. He noted what they had eaten or expectorated. He collected tufts of feather-fur, as well as stool for the laboratory.

He looked up. Animals climbed and swung and jumped through the canopy, their bodies tinted like amethyst, serpentine, or amber. They jostled and played and fought. He observed degrees of prehensility in proto-hands and tails. He found biscopism and omniscopism in creatures with two, four, or eight eyes. One species's hind legs had fused evolutionarily with a long tail, and Bilit wondered what ecological advantage this offered.

He looked down his exoskeletal legs into the scrub. Ten thousand species surrounded him, many more if he included microbes. A thousand tree species grew within the hectare where he stood, their evolution constrained within their genotype-environment expression, guided by similar forces to those which existed on Earth.

Life, Bilit mused, might be both wildly unique and astoundingly predictable on every Earth-like world in the universe. Yet the forms of Joon's life varied from anything which Bilit had known before, variations which stole his breath at every turn.

He turned up his chin to feel Piscium's rays on his face, filtering through the garnet canopy. The universe admitted nothing but causality and quantum mechanics, but in that moment Bilit felt nothing but magic.

THE AI WHICH PILOTED *Curiosity* had woken the command crew as she'd entered Piscium's Goldilocks zone. She began printing their new nervous systems eleven months prior, constructing a lattice of neural tissues around the crews' sleeping synthetic nets. The AI completed their bodies with

carbon, calcium, and potassium retrieved from Joon and its star system. Body-printing allowed these explorers to avoid degenerative conditions and cellular errors associated with long suspended animations. In situ, it let them tweak physiology to accommodate unexpected local conditions while retaining their essential humanness. They wouldn't quite feel comfortable on Joon, but they'd be more able to endure it.

The crew awoke with their continuity of consciousness intact, identities unbroken, on approach to an Earth-like world twenty-four light years from home. The journey had taken over two centuries. Upon arrival, command deployed robotic explorers and satellites, established orbit, and gathered oceans of data. Orbital arrays transmitted reports to Earth, missives which would not arrive for twenty-four years.

They received news too. Transponders stacked every incoming message which had originated from Earth since the moment of their departure until twenty-four years before their arrival. The crew opened an extra bottle or two of champagne; it appeared the Terran race had survived the last twenty decades, despite one last global war, several nuclear disasters, and continued suffering which remained despite heroic efforts. Among thirteen billion, four billion suffered on in poverty.

Ten-year-old messages arrived from the Gliese system, as well. *Curiosity's* crew marveled at this. When they had left Earth, no planned mission to Gliese 105 had existed. The Gliese mission had departed *after Curiosity*, but it arrived at its destination forty years before. Aerospace technology had improved.

In expectation of *Curiosity's* arrival, Gliese had transmitted schematics for an ansible, a device which employed quanta and variations in the so-called gravitational constant to transmit data faster than light—or rather sidestep relativistic limitations

entirely. No such thing as warp speed existed yet—the trudge between stars remained—but useful messages became possible.

On the first successful test, *Curiosity* sent the message: HELLO, GLIESE.

Four minutes later, Gliese replied: WELCOME TO THE FAMILY, JOON.

This warranted yet another bottle of champagne. The deep freeze had preserved it well, bubbles and all.

THE NATURALIST JOHN BURROUGHS wrote, “Love sharpens the eye, the ear, the touch; it quickens the feet, it steadies the hand, it arms against the wet and the cold. What we love to do, that we do well. To know is not all; it is only half. To love is the other half.” Burroughs would have loved Joon as much as he loved his treasured Catskills.

Bilit waited for dusk before setting base camp, his sentries established a perimeter, and assembler robots raised a tent and tarp. Bilit eschewed the sturdier structures preferred by most other field scientists—the hard-shelled erector sets, the nano-assembled arcologies, the mobile labs. He valued the tent’s simplicity, its tininess, the way the membrane left so little between him and the waving grasses, the blowing trees, the singing leaves, the thousand animal calls. Insect-like creatures moved through the air like Terran eels moved through water. They oscillated more like centipedes than flitted like mosquitoes, trilling sometimes quietly, sometimes in cacophony. Once every few minutes their bodies blinked like Christmas lights, then darkened again.

Protected by the tent’s filtration, Bilit rested without his rebreather. He lay on his back, hands folded on his stomach, smiling as he fell to sleep.

NO SAPIENT LIFE, THE first robots and survey teams reported. Aerial reconnaissance never touched ground. They composited low-orbital data with drone scans and high-speed manned flights. Within five weeks they surveyed a fifty-kilometer grid above Joon's entire surface.

No sapient life. We defined sapient as exhibiting one or more of these: the ability to solve novel problems through creative approaches; language; compound tool making; or complex cultural transmission, verbal or otherwise. Recon searched for domiciles, villages, towns, or cities. They found none. They identified no alterations of land, no agricultural patterns.

No sapient life, they reported. Proceed with Phase I ground reconnaissance.

No sapient life.

BILIT AWOKE TO RAIN. For a while, drops pattered on the shell and then for seventeen minutes became a deafening kettle drum. Bilit lay still, hands still folded on his stomach, eyes open to the dark. For the moment he retained a normal optical range, which meant he saw nothing. He focused his other senses. Joonian rain almost smelled like Terran rain.

The ground gave off a scent of soaked clay and loam. Plants smelled like plants, but an unfamiliar pepperiness spiced the forest. The jungle resounded with strange calls.

Something walked through the underbrush, somewhere beyond the sentries. Bilit guessed its size between a deer and a horse, moving quadrupedally but undoubtedly a hexapod, forelimbs for other tasks. He heard only one, and it circumscribed his camp not once but twice.

An unusual visitor, he thought.

At last he modified his vision and the tent interior resolved into pale grays and blues. He sat up and turned his

head, augmenting his hearing, the nanites within his skull reconfiguring to the purpose. He detected deliberate steps, twenty meters distant, just beyond the sentry line.

Something tapped solid wood, but no lignified plant grew so close to his tent.

Carrying a tool, he thought, and his heart raced. His adrenals stepped into high production, but he forced himself to calm, to temper his excitement and unbidden fear. Tools meant intelligence, and intelligence suggested real danger. The approaching visitor took another tentative step forward, followed by another—

The sentries triggered their first defenses. Eight hundred lumens turned the pitch black into a blinding violet-white, and a whine echoed from their speakers. A powerful blow knocked one sentry onto its side. The visitor fled into the jungle and, as it crashed through the undergrowth, the pattern of its feet or hooves reminded Bilit of an antelope.

The sentries ended their alarm, but their lights remained. The fallen robot righted itself and suffered no further attack, but Bilit waited before stepping from the tent, his rebreather restored to his mouth and nose. The moist night raised goose bumps on his naked body. He examined the damaged sentry—a long scratch ran across its LED shield, but it showed no other damage.

That shield, he considered, was made of diamondide.

He searched the grasses and found a rigid two-meter shaft of lignified plant fiber wrapped by a braided cord. A sharp point, fifty centimeters long, emerged from one end. A spear.

Within his ear, his comm beeped. “Bilit, this is Stephanye. You all right?”

Curiosity's primary AI, Stephanye, would have detected his sentries' defenses. He replied through remote satellite array, "I'm in awe of the universe."

"Can you clarify?"

"Sapient life."

Silence. Then, "The patterns recorded by your sentries suggest a high probability of sapience signified."

"I'm looking right now at one beautiful example of a tool."

"Did you sight the life form with your own eyes?"

"No, unfortunately."

"Can you record the tool in situ," the AI asked him, "and then bring it in for analysis?"

He sighed. Hands akimbo, he looked out into the darkness, though his low-light vision revealed nothing but silvery trees.

"I'm tempted not to," he replied.

"Reasoning?"

"It doesn't belong to us, and I'm not sure we should begin first contact by stealing."

Hesitation. Then Stephanye argued, "We can borrow it then."

BACK UPON THE *CURIOSITY*, Bilit walked the outer corridor alongside a foglet projection of Stephanye, a being as physical as he but capable of vanishing in a millisecond, of reconfiguring herself into a new form, of translating herself to any part of the ship. Dark hair pulled back in a bun, bright blue eyes, straight-lined white suit—an entirely computer-generated beauty. She carried an old-fashioned clipboard and wore anachronistic glasses. Bilit mused at how this merely added to her appeal.

"Why the glasses?" he asked the AI.

"They look cute," she replied.

“Why would you, an AI, want to look cute?”

She affected a shrug. “It makes me happy.”

“Tell me, Stephanye, can you truly feel happy?”

“Emotions occur in the brain,” she said, tucking a wooden pencil behind her ear. “They’re cognition. I cogitate better than you do. Ergo not only can I feel happy, Bilit, but I can feel happier than you can.”

He smiled in amusement. “Is that so?”

“It is.”

They joined Reginald in the port laboratory. The spear hovered within a scanning chamber. White light contrasted the earthy tones of the weapon. The haft was of a fine-grained pale wood, five centimeters in diameter. Its grains held the preserving oils of other plants, as well as proteins reminiscent of old sweat. For one hundred twenty centimeters of its length, a braid of woven grass wrapped the shaft. Elaborate knots held it in place.

Bilit pointed at these. “Designed grips, craftsmanship, and singular care.”

Another cord and a splint held the dark-gray spearhead. Its non-ferrous edge could flay meat from bone. A capable thrower could drive such a weapon through a man’s body.

“We’re still having trouble,” Reginald said, “distinguishing any familiar DNA sequences here, but we found remnants of many animals’ DNA imbedded behind the spearhead.” He adjusted his well-cut shirt collar as he examined two holomonitors. His trimmed hair contrasted with Bilit’s, who like many field ecologists cut his perhaps once per month. “My bet is this weapon has killed many times.”

“What life forms would it have killed?” the AI asked. “A cross-section of animals for consumption, or enemies and other predators?”

ABOUT THE AUTHOR

J.L. FORREST WRITES FROM the cool, wet techno-jungles of the Pacific Northwest, the frosty Rocky Mountains, and the narrow, ancient streets of Roma. He is the author of numerous short stories and novels, and he has published works both science fictional and fantastical with the likes of *Analog Science Fiction and Fact*, *Crossed Genres*, *Third Flatiron*, the *Robot Cowgirl Press*, and others.

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