

# Lab B-15

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## Nick Wolven

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The young man was sitting outside the parking garage, and right away Jerry thought that was weird. This was the Arizona desert, middle of summer. People didn't sit outside. They especially didn't sit outside ugly parking garages, on strips of hot concrete, with no grass in sight.

The boy was Arvin Taylor, one of the lab techs from the day shift. Not a person Jerry saw often, though technically one of his employees. He ought to be working, not lazing around outdoors.

"Arvin." Jerry pulled up, rolled down the window. "What are you—?"

But Arvin was already hurrying toward the car.

"Doctor Emery." All the techs addressed Jerry as "Doctor." It was something he insisted on. None of this Joe-John-Jane stuff, everyone on a first-name basis, like they were Mouseketeers or flight attendants. With the work they were doing, they couldn't afford to be casual.

Arvin bent down, peering in the window, squinting in the sun. He was dressed professionally but cheaply: Dockers, button shirt.

The boy must have been sitting outside for hours. His shirt was soaked with sweat. He looked woozy, sunstruck.

"I'm glad I caught you, Doctor Emery."

"How long have you been out here, Arvin?"

"It's really important." The young man's eyes slid sideways, feverish. Jerry worried he might pass out. "I have to tell you . . ."

And that was it. Arvin's mouth hung open, tongue moving vaguely.

Jerry put a hand on the gearshift, a gentle reminder. He had work to do, places to be. "I'm due in the office. If I'm not mistaken, you're supposed to be there, too. Doesn't your shift go till six?"

Arvin wasn't listening. His eyes had assumed a peculiar cast, half daft, half frantic, like a circuit inside him had failed to connect. "It's about . . . Lab B-15."

Jerry set his teeth. Lab B-15 was one of their experiment rooms. Lot of pricey equipment in Lab B-15.

Not to mention the subjects themselves.

*Subjects.* That's what they called them: *subjects*. The word always made Jerry wince.

"Arvin, if anyone has been mucking around with the stuff in the labs—"

Arvin's face was pained. Like a child about to cry.

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“Is it Anand?” Jerry’s tone was stern. “Has he been fiddling with the environmental controls again? Because I’ve told him and told him—”

Arvin backed away. His hands were clawed, not quite forming fists. His eyes might have been tearing up—at this distance, Jerry found it hard to say.

“Please, Doctor Emery. Please check.”

“Arvin. I hope you understand how unprofessional this is. Arvin! Are you having some kind of breakdown?”

But the young tech was already far from the car, shaking his head, stumbling backward across the crushed stone that filled the curbs around the garage entrance. Now he looked up, staring into the distance, upper lip drawn into a snarl against the glare of the southwestern sun.

Like a paranoid schizophrenic, Jerry thought. Like someone terrified of everything, of nothing. Of the world.

Jerry checked over his shoulder. Nothing there but the road curving into town, rocks and scrub, the suburbs of Phoenix at the desert’s edge.

By the time he looked back, Arvin was gone, vanished into the garage, or into the blinding sunlight.

\* \* \*

It bothered Jerry, as he drove up the ramp, circled the garage levels, and parked on the top deck by the building entrance.

Frankly, it bothered him a lot.

He crossed under the pavilion of solar panels. At the coping, Jerry stood gnawing a knuckle. Below were the arabesques of housing parks, roads curling into cul-de-sacs lined with mini-mansions. The highway ran out, into the desert, ending here at a low hill rising from seas of solar farms. Atop stood a glittering cluster of glass buildings.

The Baxter-Clade Medical Center was funded with big donor money. It focused, consequently, on big-donor interests. Late-life therapies. Antiaging boondoggles. Artificial organs. A sample platter of rare cancers.

The center was ostentatiously eco-friendly. Most of it lay below ground for better temperature regulation. That was where the riskier institutes were located. Research teams toiled on top-dollar projects, out of sight, literally underground, flush with tech-guru cash.

The thing about rich donors was that they lived a long time. As a result, they tended to develop rare ailments. They also fell prey to freakish obsessions.

Baxter-Clade catered to both.

One of the labs on Jerry’s floor was working on treatments for Gorham-Stout disease—or, as it was evocatively called, “vanishing bone disease.” An affliction with only a few hundred reported cases, it was poorly understood. One of those cases, however, was the son of a hedge fund manager. Hence, research proceeded apace.

Another group did blood rejuvenation, cloning cells from youthful donors. There were teams working on weird voodoo with DNA, stuff even Jerry didn’t understand. Then there was the cryo team. They got all the press.

Rich folks who came to the clinic saw little of this work. They stopped in for their transfusions, their biopsies, their nouveau froufrou therapies. Receptionists guided them to the upper floors, with big windows and attractive rock gardens. They didn’t see what went on in the basement, the teams of researchers on their three sublevels, the doors labeled with names like In-Trans, Telomeric Initiatives, The Morgenstern Institute for Advanced Longevity. It was all a big warren of bare walls and offices. Rooms were labeled by number. Office A-7, Kitchenette K-1.

Lab B-15.

Jerry turned to the building. When the institute first headhunted him, they had offered a generous package. Attractive benefits. A salary double what he was making at the university. Perks such as only Baxter-Clade could provide.

That wasn’t what had lured him out here to this desert bunker. Jerry came to escape. From academia, from his course load, from campus politics, from faculty squabbles. Drawn by a chance to work alone, away from humans, their drama, their demands, he had fled out here to

the wilderness. He had done it, at bottom, to get away from small talk.

Jerry kept an eye out for Arvin as he crossed the garage. It bothered Jerry when people acted strangely. When they showed excessive emotion, flirted, joked, gossiped, bantered.

When they panicked.

Hell, it bothered Jerry when people did *anything*. It was why he preferred to work at night, showing up around dinnertime. He saw his assistants in the evening, in the morning. He gave them their instructions. He expected them to comply.

No backtalk, that way. Nice and simple.

Why couldn't people just do their jobs?

Why couldn't they keep things neat and easy?

The elevator carried Jerry down five floors.

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On sublevel three was the Fallows Institute, Jerry's employer.

He brought his coffee to the administrative office, where he pulled up the intranet and checked the logs. Nothing. Jerry ran through camera feeds, checking every room, paying special attention to the labs. Nothing. He took the controls for Lab B-15 and made the camera scan the whole room, whirr-whirr, rotating on its mount. He couldn't see into every cupboard, but he saw enough.

Nothing here.

Jerry pulled up one of the surveillance AIs, a little program that scanned video footage for anomalies. He ran it on the camera feeds.

Nothing.

Jerry ran through the feeds himself, seventeen hours of stored footage, skimming for anything that looked weird. The thing was, they didn't even use Lab B-15. At all times, they kept one lab idle. It was a planned redundancy, given the nature of their research.

And Jerry found nothing, absolutely nothing. No one going in or out. No rattling machines, no smoking centrifuges. No one had even turned on the lights. The whole show played out in grainy night vision.

Pointless. Ridiculous. Nothing to see.

No spooks or poltergeists, that was sure.

Jerry ran the day's reports. Along with punch-card entries and ID checks, he reviewed computer logins, door access checks, front gate checks, parking-space scans, equipment usage. No one had entered Lab B-15. No one had used the equipment. No one had taken anything from the shelves. Every item in there had a radio tag, and they were all logged and inventoried, in their proper places.

The place was a crypt. Deathly still.

*Deathly.*

That got Jerry thinking.

He made himself do it. He pulled up the camera feeds again.

And he checked the freezer room.

If there was one part of the institute that might conceivably drive someone crazy—a sensitive soul like Arvin, for instance—it was the freezer room. Jerry himself got chills in the freezer room. And no, not from the cold.

Once upon a time, back when Jerry started, they hadn't called it the *freezer room* at all. They had called that room the Morgue.

The name hadn't stuck. It was too descriptive, too vivid. Too, well, accurate. They settled on a different name, one that got the point across with minimal morbidity. "Freezers." That did the trick.

So Jerry checked the logs for the freezer room.

The freezers were fine.

What the hell was Arvin talking about?

Jerry sat back, chewing a knuckle. He'd done due diligence, checked every contingency.

One thing he did *not* do was get up, walk down the hall, and enter Lab B-15.

## ANALOG

Hell with it. Jerry shook his head. He'd already wasted enough time on this nonissue. Arvin was having some kind of breakdown, that was all. What the younger staff called "a moment." People did this all the time, they had "moments," giving into unreasonable emotions. It drove Jerry nuts.

On a whim, he ran a check on Arvin's movements. Nothing unusual. It was a typical day: in at eight, on the dot. Out for lunch at one o'clock sharp. Back at two, again on the dot. Except for the stint in the parking garage, the young man had spent all day at his station.

Jerry looked again at those numbers. Eight o'clock sharp. One o'clock sharp. Two o'clock sharp. Everything was exact to the second. Were those numbers . . . maybe . . . a little *too* typical?

Stop. No point getting fanciful. Jerry actually laughed at himself, snapping off the screen (and Jerry Emery rarely laughed). This was crazy. Arvin's hysteria had infected him, too. Eight sharp. Two sharp. It wasn't so unusual. It was how things should be. Punctual. Orderly. A nice average day.

Jerry had run the numbers. He'd checked the logs. He had work to do.

He closed the program.

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In the institute, the day shift was winding down. Machinery hummed in Lab B-11; the S&D machine was running a scan. Jerry found it a soothing sound. It would go on for months, night and day, with only intermittent breaks to cool the equipment. Like a refrigerator running, a comforting drone.

Kim Naylor, the head biologist, was bent over the optical dissector, lasering away at a cart of tissue samples. Kim was the opposite of Arvin, a no-nonsense type, crisp and obsessive when it came to sample collection. A bit of a slob with respect to appearance, but her work was unimpeachable. Jerry thought of saying hi, but why bother? They'd make awkward small talk; they'd both be put out. Better to get to work.

His office beckoned, a nest of ragged paper. Printouts were sticky-tacked to the wall, hanging at angles, covering more printouts, all scrawled with equations running sheet to sheet. Figures had been crossed out dozens of times, blurred under blizzards of recalculation. Lately Jerry had abandoned math in favor of cryptic conjectures, scrawled in marker.

*Reduce optimization of synaptic updates?*

*Try zero batching of nodal spike selections . . .*

*Apply forced stimulation! All inactive circuits!*

Recent additions were little more than desperate outbursts.

*Enough models!*

*Startup matters?*

*More FLOPS!*

It was the literalization of a brainstorm.

Jerry shuffled through the litter. Everything important was done in the computer. But when Jerry was frustrated, he printed, he scribbled. If nothing else, it gave him the satisfaction of crumpling up his failed ideas.

He certainly had been doing a lot of that.

Plunking himself down, Jerry ran the week's reports.

Subject Arnisev's run in the VALIT environment had undergone critical degradation across all clusters.

Subject Yamahoto's run had catastrophically failed after twenty-seven seconds.

Subject Polodny's run in the new "Veritude" sim had performed successfully for almost seven minutes, with a slowdown factor close to zero, rich dynamic performance across functional minicolumns, and interactions with the chemical perfusion model that matched observations on organic subjects.

Great!

But at four hundred seconds, even this last model had undergone calamitous disintegration, fragmenting into disconnected circuits that pulsed and strobed like schizoid Christmas lights, convulsing into seizures of disconnected stars.

On and on it went. Crashed programs. Busted experiments.

Jerry curse and chewed a knuckle.

The numbers changed from trial to trial. But the basic problem was always the same.

They had names for it in the office. The spasming issue. Mechanical mouse. The jitters.

*Subject one's gone mechanical mouse!*

*Subject seven's caught the jitters!*

Jerry called it what it was.

Braindeath.

"Jerry?" It was Kim, her glasses askew, leaning into his office. Weird. Jerry could have sworn he'd closed the door. But there Kim was, standing in his riot of papers. "I'm off for the night. We're almost finished with the supplemental scans on Bogstrand. Once we've built out the diffusion effects I'll feed them into the signaling simulator. We can have full volumetric analysis by Friday, I think."

Jerry spoke around the knuckle lodged in his teeth. "Thanks, Kim."

Five seconds later, he realized she was still there, fingers curled over the jam, eyes distracted under her steel-colored hair. "You'll be okay here by yourself?" Kim sounded worried. "Chris is off for the night. Marjorie just left. I sent Arvin home."

Jerry looked over the top of his monitor. "What happened with Arvin, anyway? I saw him outside, by the garage. He seemed . . . distressed."

Kim's face contracted, lips parting, brows contracting. Not worried, Jerry thought. Puzzled. A rare emotion for Kim Naylor, but that was how she looked right now: utterly baffled, as if a peculiar and upsetting thought had come to her unbidden.

"You know," Kim said, faltering, "you really should . . . you should look into Lab B-15."

Her eyes were like Arvin's, half-dreaming and feverish.

Jerry narrowed his eyes. "And why is that, Kim?"

Kim bit her lip. "I just think you should do it, that's all. I really think you should check it out."

Jerry stood slowly, coming around the desk. He studied Kim before speaking. "Arvin said the same thing. That I should check Lab B-15." Kim said nothing, only stared, goggle-eyed. Jerry continued, "I reviewed the security files. I checked the footage myself. I didn't see anything."

"Lab B-15," Kim said, and it was clear now something was wrong. Her voice had gone hollow, haunted, strange. She spoke like a woman possessed. "There's something in there you need to see, Jerry. Something . . ." Her words ended in a fading whine, leaving the thought unfinished.

Jerry stuck his knuckle between his teeth. "You know, I don't appreciate being teased. I have five hundred failed trial runs to explain, seven donors breathing down my neck. We're in crisis mode. If this is some kind of game, or prank, or—" It came to him. "If this is a set up for a surprise party, Kim, I swear, I don't even—"

But Jerry must have blinked, or lost focus, or blanked out. Kim Naylor was gone.

\* \* \*

All night in the office, Jerry worked alone with the machines.

Once, Jerry had appreciated this slumberous ambience. The quiet of the underground office drew on the profounder silence of the southwestern desert. The dreamlike glow of the fluorescent lights cast a hallucinatory clarity over the halls. Machinery humming in unoccupied rooms. There were no people, no distractions.

It comforted Jerry to pace in these clean dark corridors, with nothing to keep him company but computers. It gave him time to think.

But all he could think about now was failure.

Fifteen years. Twenty-seven subjects. So many hopeful trial runs.

They'd been cocky, at first. The key techniques were well-established. Early tests had seemed promising. And the core concepts were sound. Hell, weren't the concepts sound?

The donors certainly thought so. Cash had flooded in.

Now what? Angry billionaires called Jerry every week, wanting to know where their money had gone. And the reporters, the damn reporters. Popular science magazines had overhyped the

initial press releases, as they always did. Now, a new generation of hacks came sniffing around every week, eager to sensationalize Jerry's failure.

Even state politicians were in on the feeding frenzy. Aides from the governor's office had called, reminding Jerry of nice dinners he'd attended, honors he'd been granted, favors he'd received. Reminding him he was representing their state, as a kind of biz-tech-science celebrity. They told him in grandiose tones that they wanted Arizona to continue to attract future investment.

But it wasn't any of those pestering people that bothered Jerry, in these late hours, when he roamed the halls like a ghost. It wasn't even the shame of his failure. It was the problem itself—the taunting, impenetrable, impossible problem that dogged his entire career.

Damn it, the process should *work*. It should be *viable*. Everything Jerry knew about physics, about science, about biology, about humanity—everything led to the firm conclusion that his concepts and methods were sound.

So why were they struggling? Why were they floundering, stagnating, running the same futile trials again and again?

Jerry stopped. As if by chance, he found himself at the door of Lab B-15. The metal was painted green, windowless and featureless. An LCD on the wall displayed the room schedule. Nothing unusual that Jerry could see. Nothing problematic.

Jerry stomped away. He went back to the admin office, where, like a dog returning to a funny odor, Jerry checked the logs again. He took a tour through the entire institute, searching the silent rooms. One of the techs might be playing a prank.

But no one was here.

As always, Jerry was alone.

The featureless door of Lab B-15 summoned him back. It vexed Jerry, teased him with its mute inscrutability. It seemed to represent the universe at large, the stubborn laws of physics and physiology, defying his intellect and will.

Or rather, it was like a barrier erected in his mind itself. A dumb and offensive obstacle, impenetrable and obscure. An instantiation of his ignorance.

He slammed a palm to the ID pad, and with his other hand he jerked the handle down, violently, as if giving in to a bully's taunts. And with his jaw set in anger, Jerry Emery pushed open the door.

\* \* \*

And he was in his car, easing up the drive, blinking in the powerful sun.

The young man was sitting outside the parking garage, and right away Jerry thought that was weird. This was the Arizona desert, middle of summer. People never sat . . .

A squeal of brakes cut through the desert air. Jerry stopped short. He shouted out loud, almost banged his chin on the wheel as he jerked in alarm. The kid—Arvin Taylor—rose slowly from the curb where he'd been sitting, peering with concern into the car. Jerry sat back, gulping deep breaths. A gathering panic gripped his lungs.

The same. This was exactly the same.

He'd lived through this moment before.

Arvin came forward, squinting in the sun, and tapped the passenger window. Jerry sat as if numbed, unresponsive. Jerking into startled motion, he brought the window down.

"Hey, Doctor Emery? Are you okay?"

"I think . . ." Jerry held his breath, waiting for the tightness in his chest to loosen. "I think I'm having the world's worst case of *déjà vu*."

"Oh." Arvin seemed unsure what to say. He glanced into the desert, squinting at the suburbs below. "I wanted to tell you—"

"Lab B-15." Jerry looked up into the tech's blinking face. "Let me guess. You think I should check out Lab B-15."

Arvin's face twitched, lips pulling back, as he winced in the merciless sun. He pawed at the back of his neck, self-conscious. "Uh, that's right. It wouldn't take long. But I really think you should take a look inside."

“And find what, Arvin? What’s in the lab?”

Another spasm contorted Arvin’s face. Confusion mingled with compulsion, as if Arvin were a machine, programmed to obey two forceful but conflicting imperatives. “Lab B-15 . . .” he said falteringly.

Shaking his head, Jerry drove by, leaving the young man blinking on the curb. When, after a moment, Jerry checked his mirror, Arvin had disappeared.

With the intensifying quiver of terror in his chest, Jerry drove up the levels of the parking garage, locked his car, and ran to the coping wall.

The desert. The solar farms. The town.

All spread out below, the acres of solar panels in black, neat rows, and the curling arabesques of streets, with their identical houses on neat square lots.

Everything ordinary, orderly—but wrong.

Yes, it was true. Something in the scene, the layout of the houses, the grids of the solar farms, the desert itself—something was undoubtedly, ineffably wrong.

Jerry bit his knuckle, feeling the sweat burst out on his brow.

\* \* \*

Underground, in the institute, Kim Naylor sat at her optical scanner, zapping away at her batch of slides. Tissue samples, sliced ultrathin, vanished into a fat red box, where the angled beam of a pulsing laser kicked them, whiff by whiff, into a centrifuge. Jerry hovered in the doorway, listening to the muted churn of the nearby S&D machine. Everything was ordinary, typical. A humdrum afternoon at the lab.

After he’d lingered in the door a moment, Kim turned and pushed up her glasses. “Hey, Jerry? Something wrong?”

Jerry backed away, rocking on his derby-shoe heels.

“You know,” Kim said, “as long as you’re here. I wanted to tell you. Lab B-15—”

“Lab B-15,” Jerry echoed, shrilly, hearing the hysteria rise in his voice. He pushed away and ran down the hall.

Jerry stumbled to a halt at the door of Lab B-15. The LCD inset was a colorful blur, smeared by the fear that distorted Jerry’s eyes. Jerry’s head was such a whirl that he had to stare for three seconds, forcing the display to resolve into clarity. Already he knew what it would say. Nothing unusual. Nothing out of sorts. Everything typical, everything ordinary, orderly and exact as a chessboard.

Jerry placed his palm to the scanner, listening for the beep.

And gripped the handle. And pushed down.

As the latch clicked open, Jerry stopped.

Wait. No. Not like this.

Take a deep breath. There, good. Another. Hold it.

Now. Step back.

Pause. Collect yourself. Think this through.

Jerry turned, smoothing his shirt with unsteady hands. He walked back down the hall.

Kim, at the end, was leaning out of Lab B-11. “Jerry? What in the world are you—?”

“Lab B-15,” Jerry said, cutting her short. “Kim—what exactly did you want to tell me?”

Kim narrowed one eye, glasses askew, as she angled her head to indicate puzzlement. She seemed at once defensive and perplexed. “Well, I guess—just to take a look inside, that’s all.”

“At what? At *what*, Kim? What’s going on?”

The chief biologist’s eyes blinked rapidly. Her attention slid away, back to the optical scanner, the waiting stack of unfinished work. “You know, I should get back to these chemical assays. I think if I finish with the Bogstrand inputs, we can have volumetric analysis by Friday morning—”

Jerry grabbed her wrist. “Lab B-15, Kim. What’s going on in Lab B-15?”

Kim’s eyes were wide, flicking through alarm, fear, disbelief, settling at last on irritation as she glanced at the hand he had clamped around her wrist. “Jerry,” she said sternly.

He let go, struggling to calm himself, gulping air until his chest felt swollen, his heart like a

## ANALOG

piston, driving hard. His head became a buzzing blank of confusion; he couldn't breathe enough to think clearly, couldn't find the oxygen. "Sorry." He was mumbling. "I just—you know how I am. I like things to be clear. I don't like . . . drama."

"I know how you are, Jerry."

"It bugs me when things are—" He gave up. "Never mind. So you want me to check out Lab B-15?"

"I really think it would be a good idea."

Jerry surrendered. He let Kim return to her work. He paced the hall, panting. Deep breaths, he told himself. Hold them in.

Déjà vu. Isn't that what he'd said to Arvin? It could be nothing more than a particularly inflamed case of déjà vu.

But no. Jerry knew it was more.

He paused outside his office. He'd been working on it for years, one challenge, one problem. Every day, he'd come in at 5 P.M. He'd greeted the staff, checked the logs, run the trials, reviewed the day's results. And he'd ruminated on his failure.

The hum of equipment. The whirr of the surgical blades. The near subliminal whine of the CPU cooling fans.

It all iterated by imperceptible degrees, ticking with the inexorable subtlety of a processor clock. Monday to Sunday. Different staff schedules, but always the same regimen. Long hours of cogitating, pacing, muttering. Same actions, futile actions, repeating ad infinitum.

Could Jerry have gotten confused? Time became strange, on a project like this. Monday blurred into Wednesday, Saturday into Sunday. Days dragged like years. And yet, paradoxically, an entire decade could pass without yielding measurable results. For they had taken on that transcendent task—

*To have squeezed the Universe into a ball*

*To roll it toward some overwhelming question,*

*To say: I am Lazarus, come from the dead,*

*Come back to tell you all, I shall tell you all . . .*

Jerry entered his office. Notes blazed at him, red-marker traces of past and recurrent frustrations.

*+2 TB for ephaptic arrays?*

*genetic expression states: more data? Less?*

*Noise reduction—still important!*

And the calculations of nanometer volumes, data compression, interprocessor transmission speeds.

The computer—Jerry tapped a key. The logs were all here. He'd studied them, day after day, until his eyes were glazed, ciliary muscles no longer able to focus, mind running numbly over familiar numbers.

*Full model failure occurs within five hundred seconds.*

*Irreversible degradation occurs at twenty-seven seconds.*

*Critical fragmentation begins at twenty seconds.*

How many times had he ground through the same estimations, proposed and rejected the same solutions? More processing power. New scanning methods. Maybe the technology just wasn't there.

And always he came to the same closed door.

Jerry left the computer and stood in the hall. Years of cudgeling his brain had yielded nothing. Cudgeling—how apt, that old cliché. Jerry felt beaten, breathless. People always told him he worked too hard.

On a hopeless whim, he moved down the hall, to the unforthcoming door with its LCD screen, its mocking green placard. Lab B-15. Jerry pressed the scanner. He flung the door open. He passed through—

\* \* \*

And was back in his car, pulling up to the parking garage, eyes already shifting, by reflex, to

the young man who would be sitting there, waiting on the curb—

“Doctor Emery?”

*No, no, no!*

“Doctor Emery, what’s wrong?”

\* \* \*

## 2

Jerry pushed aside papers, rubbed his eyes, and held his throbbing head.

He stretched out a nerveless hand, tapped his computer. And for the thousandth time, he brought up the test results.

Concentrate, Jerry told himself. He had to think this through.

Jerry sat in his office, wallowing in the somnolence of the midnight hush. He had run through the time loop five more times before accepting it as a new feature of his reality. Every time he passed through the door of Lab B-15, the course of time reset; the night began again. That had been empirically verified—it was, from his limited and subjective point of view, a demonstrated fact.

With this established, Jerry had settled here, in his office, with his notes and records, locking the door and holing up in a secure and contemplative privacy.

Jerry was a scientist. His strength, his weakness, and his signature trait was a lifelong penchant for methodical thinking. Even in a state of panic—and what situation better justified a state of panic?—Jerry would do what he did best. He would pause and reason. He would work this out. He would, at the very least, form a hypothesis.

So, when Arvin made to address him, Jerry had shrugged the boy off. He had ignored everyone who tried to accost him. He had come straight to his office and turned on his computer and forced himself to concentrate, as best he could.

And he might—just might—have found an answer.

Jerry trained his weary eyes on the test results. For the millionth time, he ran the numbers. He flipped to the imager. With the lazy precision of habit, Jerry ran recorded trials at different speeds, different resolutions, viewing the results from different angles. In the data-visualization schematics of the imager, observations played out like abstract art, branching bolts of color-coded lightning.

Glimmers on water, Jerry thought. Streaks of reflected light. Shimmering trceries, cycling and swirling.

Cycling.

Repeating.

Jerry sat back, light-headed.

It couldn’t be true.

But was it?

He pushed back his chair, shuffling through his piles of papers. Images flurried in Jerry’s frightened brain. Curling patterns of housing parks. Notes in red marker. Electric trceries.

A tightening in his chest.

What was it Henri Poincaré had said? The famous mathematician, in an anecdote often recounted, had been mulling over a math problem, contemplating key concepts without ever arriving at a result. And then, one day, he had put aside his work, gone for a walk, stepped onto a bus—and a brilliant discovery had come to him, in a flash of unexpected insight.

It was as if the answer had been there all along. Waiting, buried, like hidden treasure, somewhere in Poincaré’s subterranean mind.

Jerry pushed open his office door. Stumbling down the hall, he saw that everything was still hushed, vague, muted, unreal. Machines hummed softly—this was the only sound he heard.

If Jerry’s conjecture was right, he didn’t have long. A few more cycles, a few spins of the wheel. A few more ticks of the cosmic clock.

Jerry checked the rooms. Silence. The other employees had gone home for the night.

Jerry knew exactly how to summon them back.

He set his hand on the door of Lab B-15.

"I've called you here, tonight, to consider a hypothesis."

Four faces looked up from the conference table below. Arvin and Kim sat on Jerry's right hand. Facing them were Chris Lister and Marjorie Cheong, two computer scientists who handled the hardware setup and modeling software. Jerry waited to see how they'd respond.

They didn't. The conference room was a scene of utter silence. As Jerry had expected.

"I want to run through this together," Jerry said. "Now, be candid. Don't hold back. If I'm right, we might have an answer to the problems we've been seeing. Questions?"

Arvin raised a hand.

"I have a question, Doctor Emery. Um—what happened to you?"

Jerry was taken aback. "Pardon?"

The young man dropped his hand. "You must have gotten engaged or something, right? Or you got a dog? *Something's* changed."

Jerry hesitated. After driving to the compound, this latest time through the loop, he'd grabbed Arvin's hand and effectively dragged him to the institute. Jerry had done the same with Kim, then gone on to collect Chris and Marjorie, the only other colleagues who were still in the office. Upon recruiting these followers, Jerry had made sure to keep them in sight. No one was going to disappear on him tonight.

Not this time.

Not while he needed them.

Jerry drew a breath. "I'm afraid I don't follow you, Arvin."

The boy glanced around the table, making himself seem even younger by grinning lopsidedly. "Well, it's just—we *never* do this. We never have meetings."

"He's right." Kim nodded. Chris and Marjorie were nodding too. "This is probably the first staff meeting," Kim said, "even a *partial* staff meeting, we've had in six years."

"You never talk to us," Chris put in. "You never want to hear our opinions."

"You just give instructions," Marjorie said.

"Then go into your office."

"With your papers. Your notes."

It was difficult to tell who was speaking, now. They chattered at once, finishing one other's sentences.

"You run the same tests, again and again."

"You get so annoyed when we do anything different."

"Then you stay here alone."

"All night."

"Pacing."

"Talking to yourself."

"We *never* have social events."

"I know, I know," Jerry swallowed. "I know how things have been. In my defense—" He hesitated, wondering if it was worthwhile to explain. "In my defense, we've been in something of a crisis situation."

"You mean because the tests aren't working," Arvin said.

"I mean because we don't—because until now," Jerry corrected himself, "we haven't known *why* the tests weren't working. We had no actionable theory. No useful hypothesis."

"We might have figured it out," Chris said, "if you ever talked to us. Even casually. We could have, you know, talked through the process. We might have found something different to try."

"We're doing that now," Jerry said and held his breath. "Listen. You all have been trying to tell me something, and I . . . well, let's say I've been a little preoccupied. But I want us all—"

They had that look on their faces. A dullness, a vagueness, as if a strange and adventitious notion had come to them. "Lab B-15," Chris said, and the others nodded.

"Forget about Lab B-15," Jerry said. "We'll get to Lab B-15. Right now I want to talk about the work we've been doing here."

Uncertain glances flitted from face to face. Jerry prompted them:

“We’ve had a total of twenty-seven test subjects. Five hundred and fifteen trials. What have we seen?”

“Well . . .” Arvin held his hands up. The answer was painfully obvious. “They fail. Every time.”

“They fail,” Jerry repeated. “But *in what way?*” He clarified: “By what standards do we call our trials a failure? What’s the end goal of what we’re trying to do?”

Arvin shrugged. Another obvious question. “Full-scale emulation.”

“What does that mean? Talk me through it.”

Jerry had expected this baffled silence. He half feared they wouldn’t talk at all. At last Kim got them started.

“You take a human brain . . .”

They had done this before, in the early planning sessions, zooming out, as it were, to consider the full scope of their task. Why hadn’t they done so repeatedly through the years, Jerry wondered now; why hadn’t they paused more often to consider the big picture? Because Jerry had been in his office, buried in details.

No matter. Gradually, communally, they reconstructed the procedure, feeling silly as they stated the obvious, yet knowing this could be helpful—a recapitulation of fundamentals, an inducement to clarity, and a nudge to creativity. So they began at the beginning, with the early work in the hospital, the removal of brains from patients, the embedding of the organs in polymer, the shipments that arrived by special courier. And on to the technical specs of their equipment, the “slicing and dicing machine” as they called it, the in-house computers. Jerry supplied prompts to keep the conversation on track. The concept was simple. But in their obsession with errata, they’d lost sight of big ideas.

The donors hadn’t. They believed passionately in the feasibility of the project: accurate, true-to-life, whole-brain emulation. Machine simulation of the human mind. The uploading of identity to a digital platform.

And with it, functional immortality.

Take a brain—say, from a very rich entrepreneur who has recently died. Scan its internal structures with magnetic resonance imaging technology. Run a second, destructive scan by shaving away ultrathin slices of material, recording contours as you go. Run additional, targeted scans on chemical samples and critical clusters. Combine findings in the best computational equipment available. Voila: you’re ready to boot up a soul.

“It should work,” Kim Naylor said. “The brain’s a physical structure, after all. If you can scan that structure in enough detail, you don’t need to know how it *works*. You just need to copy how it’s *built*.”

“Technically,” said Chris, “it should be even easier than that.”

Jerry nodded. This concept was crucial to their approach. They didn’t need to know *everything* about how the brain was built. Not the atomic structures. Not the details of molecular arrangements. Only the neural connections. The logical architecture.

“But it *doesn’t* work,” Jerry said, and prompted, “So we do the scanning. What next?”

The lab’s scanning equipment was automated. With high-precision airbearings, diamond knives, component miniaturization, and above all, massive parallelization, they could slice and dice their way through a brain, at high resolution, in four months. The modeling stage took nearly as long, beginning with coarse-grained readings and using compression algorithms and combinatorial techniques to integrate multiple scans with preloaded templates, refining distinguishing details.

With a detailed model prepared, the next step was to build a virtual environment: a virtual body, a virtual world. The team’s work here focused on two key areas: the spinal cord and endocrine system, anything that could contribute to conscious experience. Mostly they toiled over hormones, biochemistry, whatever substances commonly passed through the blood-brain barrier.

And as a final flourish, they architected a sensory reality, a kind of video-game environment, flush with sights and sounds.

“So we convert real brains to virtual brains,” Jerry said, “and we put them in virtual bodies.

And? What happens? Remember, we're thinking big-picture."

"Nothing happens." Chris expressed the frustration that had afflicted them all for months.

"Well, technically, not *nothing*. You get a few flickers of activity. That's all."

"A kind of seizure," Marjorie said.

"Fragmentation. Degradation."

They had seen it untold times. A brainscan was a virtual machine, like a computer running as a program on another computer. The scans they made appeared healthy at first. Synapses fired in complex chains of neural excitation. They operated like real organs: a triumph of simulated life.

But within seconds, the simulations degraded. Patterns repeated. Networks fragmented. Flickers of activity scattered through the sim-brains, like dwindling constellations of connectivity in a failing power grid.

The brains shriveled into fits of recurring neural impulses. Slowly, even these withered. By the seven-minute mark, every model had ceased responding. Total crash.

The scans were still intact. They could be run at any time, with the same result. They didn't decay. They simply didn't *live*. Like frozen corpses, the lab's virtual brains were eternalized in virtual death.

"I like Marjorie's word," Jerry said. "Seizure. What we've seen in these trials is like a fit, a loop. A hung program, stuck in the same futile patterns."

"But it should *work*." Chris smacked the table. "We *know* that consciousness is dependent on these neural structures. We're not writing programs; we're not building artificial intelligence. We're copying what already exists."

"And copying it," Kim said, "with obsessive precision."

This had been their research focus for fifteen years. Resolution, accuracy, fidelity. Minds ran on an organic substrate, Jerry reasoned, so why couldn't they run on a mechanical one? The question was how exact to make this reproduction. So he had steered his research toward two technical problems: 1) fidelity of the scanning methods, and 2) processing power of the simulating computers.

As far as Jerry was concerned, they had licked both those challenges.

"Kim's right. We've taken our models way past critical resolution. We've reproduced the neural connections. We've modeled ion channels. We've captured neurotransmitter concentrations. We have high-res grids for compartmentalized ephaptic effects. We have separate grids for extracellular chemical diffusions. We emulate phosphorylation states. We've even gotten into the proteome. As for our modeling hardware, it already has a capacity a hundred or so terabytes beyond what we think we should need. And it's getting better."

"While the scans," Marjorie said, "if anything, get worse."

"That's the mystery," Jerry said. "Our equipment gets better. Our techniques get better. Our models get better. But our simulations keep getting worse."

He didn't say what didn't need to be said. These virtual brains were the remains of real people, rich men and women who had contributed their cadavers to the project, expecting to die in a hospital bed and awaken in cyber-paradise.

"It's crazy." Chris put his hands to his head, measuring the complexity of the structures inside. "It almost makes you think—"

"What were you going to say, Chris?"

"Well, maybe the skeptics are right. Maybe consciousness *is* too hard a problem. Maybe there's something mysterious, subtle, that gives rise to consciousness . . . quantum effects, or a form of hypercomputation . . ."

Chris didn't utter the word that everyone, in this line of work, learned never to utter.

But Arvin did.

"Maybe consciousness is immaterial after all. Maybe people really do have souls."

"Or," Jerry said, "maybe not."

\* \* \*

Machines droned in the silence.

"I'm going to try something," Jerry said. "I'm going to try a little experiment. Bear with me. I'm going to ask you all a series of questions."

Their faces were placid, patient, not unwilling. Jerry turned first to Marjorie. "Marjorie, what day is your birthday?"

Marjorie stared. "Um," she began.

"Don't worry, it's not a trick question. Go ahead, give the obvious answer."

"Okay." Marjorie sounded hesitant. "Well . . . I think . . . let's say . . ." She squinted, at a loss, and surprised by her own confusion.

"Never mind. We'll move on to Chris. Chris, where did you grow up? What city? What state? Same as I told Marjorie, not a trick question. Just give an honest answer."

Chris looked at his hands in perplexity, then shrugged. "Well . . ." He hazarded a guess. "I'll say . . . Kansas?"

"Arvin, what was the name of your first girlfriend? Kim, what do you like to do for fun?" Jerry gave them each a moment to reply, then said, "No, that'll do, don't try to answer. The fact is, you don't *know* the answers. None of you do. You're just making stuff up."

He paced around the table. "Try this. Chris, how many lights are in this room? Go ahead and check. You can count them if you want. Take your time. But you can't do it, can you? Marjorie, do this for me. Put your hand on the conference table. Feel it. Tell me, what is it made of? Wood? Laminate? Is it rough or smooth? Are your chairs cushioned? Is it warm in here, or cool? Are there paintings on the walls? How dirty is the carpet?"

He stood by the door. "You have no idea, do you? You can't tell, and I can't tell either. None of us can answer, because the questions are unanswerable. The information simply doesn't exist."

"Doctor Emery?" Arvin looked worried. "What are you talking about?"

"I'm talking," Jerry said, "about what's in Lab B-15."

\* \* \*

They were silent as Jerry ushered them, in a group, out of the room, down the silent halls, to the door of Lab B-15. By the ID scanner they paused, huddled together like wary schoolchildren, while Jerry put his palm to the pad and grasped the handle. The others watched in a state of vague expectation as he waited for the beep of identification.

"Doctor Emery?" Arvin, first to warn Jerry about the lab, was now first to try and dissuade him from entering. "Are you sure about this? Do you really want to know what's in there?"

"It's not about knowing," Jerry said. "The truth is, I already know." He watched their faces, attentive for signs of confused emotion: dread, doubt, expectation, alarm. "Yes, I know, and you all know too. But that means nothing. Knowing is the easy part. Accepting, understanding, that's the real challenge. Accepting what we've known all along to be true."

He opened the door.

The air wafted out, sterilized and cool. The tile floors echoed Jerry's footsteps. Nothing vanished, nothing disappeared.

The contents of Lab B-15 were as Jerry had expected. The overhead lights, which had appeared dark on the security camera, were already shining when he opened the door. The cabinets and counters were officially undisturbed: no items moved, no containers opened. Nothing in the logs to indicate suspicious behavior.

But Jerry found glassware smashed on the floor—and waded through a clutter of fallen equipment.

In the center of the room, a body lay face down, legs akimbo, sprawled on the tiles.

"I noticed it when I was running through the time logs," Jerry said. "I should have been more alarmed, even then. Every number was precise and simple. Too precise. As if generated by a crude algorithm. My suspicions increased when I examined the view from the parking garage. At a glance, it seemed normal. But when I examined the details . . ."

He circled the body with measured steps, proceeding counterclockwise around the splayed feet.

"The housing parks, the highways, even the bushes in the desert, they were all laid out in simple patterns. Obvious shapes, cruder than reality. Like pictures in a children's book. The

looping, now, that was another clue. A repeating sequence, recurring with slight variations. Like another simple pattern, but this time arranged chronologically. When I looked at the test results, I was sure.”

The others stood in a circle, one strange expression duplicated on each gaping face. It was the expression Arvin had worn outside the building, approaching Jerry on the front drive. It was the expression Kim had worn when she entered Jerry’s office. It was the expression of a person stupefied by sudden insight, like Poincaré arriving at his famous, wild surmise. They had known all along. They had been amazed by their knowledge. But they hadn’t been able to give voice to their knowledge—to tell Jerry the awful truth.

*Of course not.* And Jerry shook his head. *How could they tell me? I wasn’t ready to face the truth.*

Now he squatted, elbows on his knees, and faced the truth head-on.

The body lay with one hand under its chest, pinned, clutching its shirt, twisting the fabric into tortured folds. The other hand had stretched out on the floor, fingers extended, as if reaching for the door at the back of the room. The eyes, if there had been eyes, would have stared at the door’s sign. But there were no eyes, no face, no mouth. The entire head had been removed.

“How did it happen?” Jerry looked up. “Let me guess. Heart attack? People always told me I worked too hard.” He bit a knuckle. “Tightness in my chest. Shortness of breath. Lightheadedness, confusion. I’ve been feeling the symptoms all along. I took them as a warning of something about to happen. In fact, they were a clue as to what had *already* happened. A residual effect of my final experience—a memory of my mode of death.”

It wasn’t a surprise. It was another of those things, subliminal facts, secret insights, that he seemed to have carried in himself all along.

“And, naturally, I donated my remains to the project. Now that I think about it, I remember doing so: making the decision, signing the forms. Fifteen years ago. When all this began.”

With the others watching, Jerry went to the back of the room. *Server Room*, read the sign on the door. Underneath that, someone had taped a handwritten sign, adding the nickname used around the lab.

*Freezer Room.*

Jerry pulled open the door. A kind of airlock lay beyond. It was cold in the freezer room, always cold. Aggressive climate control kept the temperature borderline arctic. A precaution. Heat buildup, and attendant equipment failure, was a major hazard for computation on this scale.

On and on the machines extended, dark and somnolent in droning rows. These were merely the on-site machines—the lab made use of remote computers, too—but even so, they were intimidating in their abundance. The powerful fans made a constant hum—the only sound, besides human voices, that Jerry had heard all night.

“I didn’t notice anything odd at first. I guess that’s how it always is. Only when I looked at things, really looked . . .”

Jerry turned and pointed at Chris. “You couldn’t count the lights in the conference room—because there were no lights to count. Nothing but a vague source of illumination. A memory of light, nothing more. Same with the table, the carpet, the chairs. All the little things we seldom notice, but that are part of everyday life. All the subtle facts, the textures, details, specifics, that constantly surround us, but that we never attend to.”

Jerry felt moved to correct himself: “All the things *I* never attend to.”

He turned to Marjorie. “I never knew your birthday, Marjorie. I never learned a thing about Chris’s past—not the town he came from, not even the state. I never knew a single personal fact about any of you, or about the rest of the research team. I stayed in my office, and I stared at my notes, and I studied the test results, over and over. And that’s the only thing I remember, now. Which means it’s the only thing *any* of us remembers.”

He walked the rows of server stacks. The others followed like obedient ducklings, trotting at his heels. Certain machines had been grouped in clusters, assigned to particular scans, particular brains. “Subjects,” the staff called these groupings. They looked like rude hardware, metal

and wire. But each was the vestige of a whole human life.

Jerry continued until he saw his own name, written, in typical lab-culture fashion, in grad-student scrawl on a strip of masking tape. Doctor Emery, it read—stuck crookedly on the steel rack. They'd labeled him Doctor Emery. They'd left off his first name.

But of course they had. He was constructing all of this. And he would have wanted it that way.

"So here we are," Jerry said. "Or rather, here *I* am. A brain in a box. A ghost in a machine. Falling apart and winding down. Chris, Marjorie, Arvin, Kim—you always accused me of talking to myself. Now, it seems, that's all I *can* do. All that's left to me. Living inside my head, communicating with you—with a group of fantasies, reconstructions, memories. Inventions of an expired mind."

It was what he'd always wanted, and now it was all he had. The ultimate solitude, a perfect privacy. A chance to think, to meditate, to solve problems—locked alone in the shelter of his thoughts.

So Jerry turned and faced them: their blank and witless eyes, their mute, attentive stares, their dumb obedience. In the humming hush of the server room, he fixated on these fading specters, these faltering memories, these relics of his all but nonexistent social life.

"The question," he said to them, "is what we do now?"

They reacted with mild surprise. "Do?" Marjorie blinked. "If what you're saying is right—is there anything we *can* do?"

Jerry frowned. The fact of his death had been implicit all along, hinted at in warnings from the fringe of consciousness. Lab B-15 was a forbidden thought, containing a memory of his final moment. Gasping, dying, on an epoxy floor.

It was clear, now, what must have happened. A few strong impressions had been seared into Jerry's cortex. The memories of his final day of life. The symptoms of his fatal heart attack. A record of familiar routines. Arriving at his lab, reviewing his notes. The walk down the hall to Lab B-15, where he may have planned to visit the freezer room. And then—a gathering tightness in his chest.

Later, when the research team had extracted his brain, scanned it, and activated the simulation, those memories had been awakened, a sketchy impression of Jerry's last living moments. Sputtering, the fragments of his shattered mind could only cycle again and again, a broken recording stuck in set patterns. Very soon, the connections would break, the network disintegrate, the patterns decay.

If the test results were any guide, Jerry knew, he had a few minutes, maybe only seconds. Subjectively, that amounted to a few more spasms of neural activity, frenzied flurries of recurrent thoughts. How many more times would he drive up to the parking garage, enter the building, ride the elevator down to confront, or fail to confront, the appalling fact of his death?

"You said this was only a hypothesis." Chris sounded hesitant. "Maybe your hypothesis is incomplete."

"The hypothesis is correct." Jerry sighed, knowing, as he did so, that even this was only the simulation of a sigh. "The world we're standing in, right now, is a net of associations, copied from my mind and simulated in a virtual machine. According to our tests, that simulation will soon fail. The question for us, for me: is there anything we can do about that failure? Any way for us, for me, to act on the understanding I've gained?"

They gaped at him, thoughtless. Oddly, Jerry found himself invigorated. Solving problems was what he had lived for, back in the lonely years of his life. And now he had himself a doozy.

Think. It was the only thing left to him. Thinking was life, thinking was fate, thinking was his final hope of salvation.

Sim after sim, in their years of research, had failed within seconds. No word had come back from within those faltering, failing, virtual minds. How could it? The breakdown was too thorough, too swift.

Jerry's research team hadn't even known their virtual subjects were conscious. No language had passed the technical barrier that divided the simulated world from the real one. No message

had returned from beyond the divide. The sim-brains never survived long enough for that kind of interface to be established. Jerry's team could only watch the flickering signals of nervous excitation. Flaring, fizzling, slowly dying.

What had those simulated minds experienced? What had those virtual people felt?

Now Jerry knew. Now he, architect of this mad project, was lost, himself, in this undiscovered country—a silicon afterlife, where he would search for answers in the disintegrating maze of his mentation.

"Think," Jerry said, pounding his palm. "We've studied this and studied this. Why do the simulations fail?"

The others only listened in childish stupidity. They knew nothing, of course, but what Jerry knew. They were figments. In life, he had spoken to people only of work, neural architectures and petaflops and code. Now this was all Jerry remembered: an existence of red-marker reveries, scrawled on the walls of consciousness.

"It doesn't make sense," Chris ventured, repeating himself. "Everything we know about consciousness, the brain—

"We simulated consciousness." Jerry interrupted. "We're here, now, talking. *I'm* here, thinking, talking to myself. *This* is consciousness. And consciousness, apparently, isn't enough. So what's missing? Come on, *think*."

He snapped his fingers. Abruptly, they were on the roof of the parking garage, five scientists at the coping wall, looking down at the desert.

The solar farms and housing parks spread out below, repeating in simple patterns, unreal.

"It's all just a construct," Jerry muttered. "A few connections and associations. Rules and recollections. All abstract."

He turned from the wall—

And he was in his car, driving up to the garage entrance, with Arvin, at the curb, rising to meet him.

"Doctor Emery?" The boy hurried forward. "There's something I need to tell you. About Lab B-15."

"I know." Jerry ran past. "I know, I know!"

He shot through the door, the elevator, the halls.

Spasms. Seizures. Circuits degrading. Experiences cobbled out of fragmentary notions. Scenes, personas, sensations, events, assembled through a process of cortical collage.

Consciousness.

Jerry hurried through humming halls. Kim Naylor stuck her head out a door. "Doctor Emery?"

"Not now, Kim."

"I wanted to tell you—"

Jerry ignored her, dashing into his office. Notes and printouts spread in scribbled disarray. Contents of his mind, they'd been memorized with near perfect precision over fifteen frustrating years. That was how he could recall them now. Charts of ligand-gated ion channels, calculations of processor power, effects of tomographic tilt on multibeam electron microscopy. Jerry's brain was a trove of technical details, all reiterating one critical fact.

They had done it. They had actually done it. They had emulated the brain. They had successfully transferred human minds to an inorganic substrate.

And all they had managed to do was to torture those minds, prodding them again and again through gauntlets of deranged hallucinations, a subjective abattoir of thought, where the structures of consciousness were slowly torn apart, to die as scattered, butchered patterns in a silicon charnel house.

Somehow the virtual world failed to register. The details didn't add up. The linkages of existence—full, viable, living existence—failed to form. The simulated mind turned in on itself, cannibalizing its own connections until it collapsed.

They'd given the human soul immortality.

In hell.

"Doctor Emery?" They were all here, now, in his office with him, speaking in chorus, voices

erily similar, faces blurred like wetted clay. “Doctor Emery, you really should check—”

“Doctor Emery, you really should look—”

“Doctor Emery, I wanted to tell you—”

“Lab B-15,” he shouted. “I know, I know!”

Jerry Emery had died in Lab B-15. And he would die there again, and again, eternally, every time this simulation was run. He would live his afterlife much as he had lived his organic life: repeating one futile action, in the silence of one little room.

“Doctor Emery?” Now he was in his car, their voices around him. “Doctor Emery?” He was in the office halls, running toward a mechanical drone that lingered and endured like the soundtrack of his life. “Doctor Emery?” And he was here, again, here forever, facing the door of Lab B-15.

Only one thing to do.

Jerry opened the door.

And cried out.

It was there, in front of him. The answer he had sought.

“At the moment when I put my foot on the step,” Poincaré had remarked of his famous insight, “the idea came to me, without anything in my former thoughts seeming to have paved the way for it.”

So Jerry Emery stood, looking at the solution his own mind had been trying to provide.

His body, his headless body, lying on the floor.

“You see?” said his colleagues, speaking with his voice, uttering the secret language of cognition. “Doctor Emery, do you see?”

Jerry knelt, murmuring. “Yes, I see.”

Here it was. Here it had been all along. The fact, the inescapable truth, of a human body on the floor.

The first time Jerry had come to this room, he’d been unable to confront the truth.

The second time, he had entered, seen his body here, and comprehended a part of the truth, a half-truth.

Now, the whole truth lay before him, plain and immediate, and Jerry saw what he was meant to see.

“Doctor Emery?”

Arvin stood above him. The boy had almost disappeared. His voice remained as a fragile phantom—as all consciousness, Jerry supposed, was in truth something of a fragile phantom. “Did you find it?”

“I found it,” Jerry said, strangely calm, and smiled with the childish delight of discovery.

In Jerry’s work, he had focused his efforts on consciousness, seeing this as the great secret of the brain. Crack consciousness, Jerry had thought, and he’d crack the mystery of the mind, unlocking the portals to immortality.

But consciousness turned out to be relatively easy. It was a higher-level function, like arithmetic or chess. It consisted of logical patterns, recursive structures, access to memories, other abstract processes.

They had simulated, however, the *entire* brain—an organ adapted over millions of years to regulate the body. An organ built for constant input, a highly calibrated flow of information.

“It should *work*,” Chris had said. Jerry knew what he meant. A human being might go blind, but she was still human. In a critical sense, her brain still functioned.

A man might be paralyzed, with no use of his limbs. But he was still a man; his brain still functioned.

How far could you extend that logic? Could you eliminate *all* input, *all* stimuli? Or provide a clumsy facsimile of input—erratic, unconvincing, incomplete?

“Think of everything the nervous system regulates,” Jerry murmured, talking, as always, only to himself. “Autonomic functions. Fluid in the ear. Pull of gravity on the bowels. Moisture on the eyeballs. Taste of your spit on your tongue.”

Helen Keller might have been blind and deaf, but she had felt her teacher touching her hand.

She had absorbed sunlight through her skin. She had breathed, she had hungered, she had itched, she had scratched.

"We built that stuff," Kim objected, somewhere behind him. "We built a virtual body. A virtual environment."

"But did we get it right?" Jerry considered their fading faces. "It's not about the system. It's about the way information flows through the system. We focused on consciousness, thought, awareness. What about the stuff *beneath* awareness? Flashing lights can give people seizures. Vary the flexibility of the tongue by one decimal place, the brain will go crazy in its efforts to adapt. Think of the subtleties. The thickness of air. The churn of the bowels. Delicate correlations of distance and sound. You wake one morning, everything's wrong: the weight of bones, the heat of blood, the stickiness of skin. Air itches. Sound lags. Color hurts, textures are strange. Your teeth are soft like putty. Maybe none of it's there at all, not even the deep-down sense that you're alive. The brain rejects what it can't process. Leaving what? Absence. Death."

As Kim said, they had built a rough virtual environment. But it was a video game tuned for attention. They'd glossed over the body's hidden billions of interactions. Even something like desire demanded exact calibration, evolving by the instant, keyed to stimuli. Of course, all sensations were encoded—in millions of bundled nerve fibers. Billions of inputs and outputs per second, all precisely timed. All important. Some critical. Mostly unconscious. All gated and processed by the brain.

And it had to work in synch. Hormones, chemicals, nervous impulses. Environmental reactions. The timing dauntingly fine.

How much of this extra material—the operations of the body, the interactions of the world—would they have to emulate? All? Some? Or did finesse matter more than raw data: subtleties of timing, shadings of sensation?

No idea. But Jerry understood: the brain might generate consciousness, but its core function was body regulation. Receiving inputs, returning outputs. And they had neglected the old coder's saw. Garbage in, garbage out.

"We have to tell them." Jerry put out a hand to touch the body. As he'd expected, his hand passed through. There was no body to touch. Only a tingling absence, the mother of all phantom limbs. "We have to let them know."

The ghosts of his former colleagues considered him, fading even as Jerry watched. It was all fading, falling apart, the life he'd known, the impressions he'd retained. Rejected, discarded, in the absence of new input. A tired routine, now wearing down.

"We don't have the answers," Jerry said. "But this is the question. This has to be the focus of research."

Jerry stood dumb, struck by the irony. With every failure, they'd added more refinement, copying the brain in greater detail. But the more detailed the simulation, the more sensitive it became. Like a delicate instrument bombarded by bowling balls, it crumpled under crude inputs. Better virtual brains *demand*ed better virtual environments.

"It has to develop in tandem. All of it. The whole shebang. Brain, body, environment. Because it's all one system. They have to know."

Jerry reached out to the phantoms. They were already intangible, mere afterimages. A world, a pseudo-sensorium, weakening as he watched. Light scattered, textures vanished. Smell was nonexistent, sound nearly gone.

How, how to communicate? How, when Jerry himself was only a wandering thought, lost in a circuit board, dumb and deaf and blind? How to make his discovery known?

The answer, as always, was right in front of him, a fading ghost sprawled on an imaginary floor.

"The body," Jerry murmured, and then: "Reach!"

He grasped at the phantoms, clutching wisps of receding sensation.

"Try to touch something. Anything. Chris, Marjorie, Arvin, Kim. Try to smell the world, interact with it. Focus, feel!"

The mind of Jerry Emery was an incorporeal specter, graphed in the pixels of an LCD display.

But that pattern could be read. The very fact that he was *thinking* meant that the scan of his brain was *running*, which meant some researcher had taken over his work. They'd be studying the charts, even now—the real Chris Lister, the living Marjorie Cheong—looking for answers to the same old problem. Answers Jerry was positioned to provide.

"It doesn't matter if you can do it. Just try. Try to feel what's missing. Everything that should be a part of this world, a part of this environment, but isn't."

He could see them touching the surfaces of the lab, countertops, papers, bright edges of shattered glass. Jerry joined them, concentrating on his body, skin and breath and alchemies of mood, weight of his limbs, brush of his clothing. All minor sensations that he normally ignored.

The ghosts of his colleagues shrank to piecemeal spirits, scattering snatches of voice, gesture, form. The world continued its degradation, patterns breaking into daubs of detail. Jerry didn't worry. The thing was to search, expand, become alive to a universe of lost variety. Consciousness itself could arouse sense impressions, stimulate vestiges of rich, real experience. No substitute for the variety of life, these traces would serve as a coded message, transcribed in the very web of his thoughts. It would offer his colleagues a clue, if nothing else. They would see his mind probing the limits of its simulation, indicating all the zones of data—the necessary data—their experiments lacked.

It was a researcher's ultimate ambition. Jerry Emery, shy recluse, would compose his last insight in lines of electricity—and send a message, perhaps the secret of immortality, back to humanity from beyond a digital grave.

*Try. Reach. Feel.*

Even as he chanted, Jerry saw them fade, colleagues blinking out like lost reflections, the lab breaking into formless noise. Soon he could no longer remember them, and then he could no longer remember what it was he'd been trying to remember. But he clung to his mission, even as the substance of his soul crumbled away. A room of scribbled notes. Numbers on a screen. Facts that built toward a great frustration. The manifestations of a lost life.

Feel, Jerry commanded himself, until there was nothing left to feel, neither light nor darkness, sound nor light. Until he was only a lingering will, compressed into a final feat of attention. With effort strangely like release, Jerry Emery gathered his thoughts—

And was here, again, on the outskirts of Phoenix, driving toward the entrance of the parking garage, as a boy rose from a concrete curb to come and greet him.

"Doctor Emery?"

The AC was frigid. Jerry noticed what he usually failed to notice, the fuzzy warmth of the car's upholstery, sticky heat of the steering wheel. The flex of muscles in his thighs and sides as he climbed out into the burning pressure of the southwestern sun.

He smelled dust, exhaust, his own warm body, washed and soaped, beginning to sweat. He heard the varied hum of the desert, a distant low-level drone of cars, insect activity keen in the bushes, a tautness of life in the vibrating air. A smack of shoes came toward him, loud on asphalt. Jerry moved his head, flicking away quick bugs, fingers trailing on a car's hot hood.

The boy stood before him, not as a person, but as a gathering of impressions: sweat, smell, cotton, breath, a stippled sheen of moisture on skin, flares of light where sun met hair. Not a concept or a conscious idea, but a treasury of sensations, rich and strange, the irreducible panoply of life. A hand thrust out. Jerry took it, held it, alive to the quivering plenitude of the moment, the flows of heat, the stirrings of atmosphere, the pressures of muscle and cloth and bone, and the graded, soothing textures of skin. He closed his eyes, and it seemed to last forever—two hands meeting under hot desert sun.

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*Nick Wolven's fiction has appeared in Asimov's, F&SF, Clarkesworld, and many other publications, and is forthcoming in multiple best-of-the-year anthologies. His personal website is [www.nickthewolven.com](http://www.nickthewolven.com). Follow him on Twitter @nickwolven.*