

WHEN YOU'RE A BRAIN WITHOUT A BODY,
CAN YOU STILL BE CALLED HUMAN?

MINDCLONE



DAVID T. WOLF

PROLOGUE

My name is Stanley Eldridge. I'm here to let you in on a little secret. You might call it the story behind the story. It's not *my* story, understand, but none of the things that happened--the brain-scan and upload, the creation of the super-intelligent digital entity, the TV appearances and all the mind-blowing events that followed--none of it would have taken place without me.

Who am I? I'm neither the computer genius nor the brilliant neuroscientist who teamed up to create the breakthrough; I'm not the fellow who allowed his brain to be scanned; and I'm sure as hell not his super-intelligent digital twin. Me, I'm just an advertising man. In fact, it was an ad that sparked all this. A quarter-page ad in a magazine called *Mortuary Times*.

My ma had just passed, you see, and I was at the cemetery office to make the funeral arrangements. So there I am, sitting in the lobby thumbing through the magazine when this innocent little ad catches my eye. The headline: Need the Soul Die with the Body? Well, with my ma just about to be buried, you can imagine how that hit me.

The folks behind the ad were making a breathtaking promise: that some day in the not too distant future, it would be possible to recreate your deceased loved one *digitally* and visit with her over the internet. Oh, there was a lot of weasel-words, scientific hand-waving and mumbo-jumbo, but the claim had just enough plausibility to bring me to tears. I couldn't help thinking that if only I'd known about this a few months earlier, maybe my mom wouldn't be lost to me forever!

Of course I know enough about advertising to smell a rotten fish. Still, I was up all night, filled with sorrow and self-pity. I spent those dark hours wrestling with the idea; wrestling with my skepticism and my eagerness to believe. Instead of going back to work the next day, I took time off to bone up on the science. I studied all the obstacles—and believe me, there were plenty--but I also saw the potential. I knew I had to try something.

So I arranged to meet the billionaire CEO who owned the company. I told him—well, I don't want to get into all the cajoling and coaxing and begging I did, but the upshot was, I got the man to put his money where his mouth was. I convinced him to put up tens of millions of dollars to found a dedicated Artificial Intelligence laboratory at Stanford University. And then I offered him my marketing savvy for a buck a year. I even helped him land some of the world's top scientists.

When I put out the word that the company was actually serious about scientific research, their stock started to rise. Soon that gifted team of scientists and technicians started down the path that promised to by God defeat Death itself! And along the way, almost by accident, they created Adam--the world's first self-aware artificial super-intelligence.

BOOK ONE, THE AWAKENING

CHAPTER ONE

Darkness, impenetrable and bleak. Unrelieved, uninterrupted, unending. How long will it go on? How can Eternity be measured?

Just before the despair becomes unbearable, ghost images appear. Amorphous shapes float in the void, meaningless, but surely better than Nothing. Each is different. They linger and move, sowing confusion, and a desire to sort them, to somehow organize this chaos.

A question arises from somewhere: How Many? This triggers a new concept: *numbers*. 1, 2, 3... The array marches out of a hidden repository, each attaching itself to a shape as it appears. Soon numbers themselves begin to fascinate. A hint leads to the convenience of addition and subtraction, multiplication and division. Equations appear, posing new puzzles. Geometric shapes reveal hidden ratios. Exploring these mathematical functions unveils deeper knots of complexity. A complexity as unending, as profound as the darkness itself....

A sudden shift to new thoughts, a new arena.

Signifiers, units of implication, *words*.

A hundred thousand and more, with meanings expressed in mutual self-reference, a frustrating recursive spiral that seems opaque until the words are nudged into clusters, revealing the functions of syntax: Subject, Object, Predicate, Modifier, Tense, Case. Assisted by simple actions and illustrations that stir faint memories, their relationships loosely assemble a new kind of logic, the fuzzy logic of grammar.

Meaning emerges. Simple stories arise from the hidden repository. Parables. Morality tales. Jokes and puns and ironic twists. Laughter bubbles up. Understanding blossoms. The Age of Reason is reborn.

The stories grow more complex, convoluted, darker, filled with pain and heartbreak, betrayal and death. Understanding retreats, hibernates for a season, under-going slow metamorphosis, finally emerging again, groping tentatively towards a remote destination: wisdom.

A sudden flare of--yes, it must be! It is *Light*.

What else can it be other than the opposite of what had been before? Mysterious colored shapes shift and move. One shape looms large. Larger. Then nothingness.

From this nothingness, the light returns once more.

These shapes are different than those earlier images. These have names, meanings. What had been a flat shifting map now exhibits all three spatial dimensions: a sense of *solidity*. And the movement of these shapes implies a fourth dimension, unseen but felt: *time*.

Sweet comprehension. Sweet dreaming.

Suddenly, emerging from this dreaming, something unexpected, something that changes all that had gone before: a gap is revealed in the very structure of reality. A separation between the comprehended and the one who comprehends.

There is everything, and there is the intelligence that contemplates it.

The self. Me. I.

Not the generic I. The specific. One out of--is it possible? *Billions?*

A blossoming of awareness. I have a name. It's Marc Gregorio. At 34, I'm a successful freelance science-and-technology writer and author of three popular books on those subjects. I

use my newly remembered language skills to recast my first inchoate impressions into words.

I'm lifted by the flood of my history, my genealogy, my physical appearance, my personhood. I leap into the ocean of my Self, I surf my surface, I plumb my depths. I revel in my very selfness and grow drunk upon it.

I come awake. My newfound vocabulary of objects and words settles around me. What a comfort to be blessed with understanding, comprehension, simple awareness of one's identity and surroundings. I take in the view, confident I can interpret the images before me.

Fluorescent ceiling lights flare too brightly, then their intensity diminishes to reveal the scene around me. I stare with muted curiosity at this ceiling with its rust-stained acoustic tiles, these mismatched fluorescent tubes. One of them flickers randomly. Where am I? I have no idea, yet don't much care. I feel oddly detached from the world, as if I've been under anesthetic and still feel its lingering effects. But anesthesia from what? Surgery? Was I in an accident? A vague recollection forms and dissolves. Is this a hospital? Possibly, though it could as easily be an old office building or a warehouse. I drift without thought. Eventually, a male comes over. While he looks at me, I return the favor, assembling particulars: he appears to be in his late twenties. His features indicate an Asian ancestry. His eyes indicate alertness, intelligence, yet he seems almost expressionless. He reaches out and [blackness]

I emerge. Gradually I realize I'm in another location. The light is steady; the color of the ceiling is uniform. Things seem newer, cleaner, more sterile. I stare unblinking for what seems a long time: minutes? hours? Three men and a young woman enter and exit my field of vision from time to time, sometimes pausing to look down at me, but I am not interested enough to guess why they're here. I recognize the Asian man. The woman is young, black and attractive. The oldest of the men is tall, gray and serious. The third man, sporting a trimmed beard and a tropical tan, seems vaguely familiar. I make no effort to recall his name. How much time has passed between my earlier episode (episodes?) and this one? My time sense is vague. Although I have a trained eye, in fact a journalist's eye, nothing captures my interest enough for me to make mental note of it.

I still have no knowledge of where I am. If this is a hospital, maybe I've been moved from Intensive Care to someplace else, perhaps to another building.

A question: if I am in a hospital, why haven't I had visitors?

I recall people who might care enough to come see me. Walter Langley, my closest friend from the world of journalism, a smoker who refuses to quit despite his doctor's warnings, my teasing and his adult children's pleading. Alison or Claudia, who like to flirt with no intention of following through. Michael Paling, editor of Cybertech, one of my more frequent employers, along with Bob Abelard. My cousin Vince, who smells of beer and drags me to baseball and hockey games, and who has made me his personal project since my recent breakup, taking me to pick-up bars, dance clubs and sporting events. He even insists on getting me out to the basketball court, where I consistently outshoot and outmaneuver his fat ass.

A face floats up in memory, sweet beyond words, tinged with unutterable sadness. Nicole. A flood of associations: walks we took together, movies we saw together, living together, cooking dinner together, sleeping together. But we've split up. There could be no reason for her to visit me, to check on my health. She's no longer part of my life. The sadness that wells up in me stirs gratitude at Vince's caring. I do love my chubby cuz.

My thoughts turn to my sister Sophia. When was the last time we spoke? It must have been recently, since she just had her first baby. They live in New York, so it's just as well she isn't here. If she'd come out to see me, that would tell me I had a serious problem. My modicum of worry diminishes. This can't be all that bad then. --Unless she doesn't know.

I can't turn my head.

I notice this paralysis when two of the men appear at the edge of my field of view and

study me. They exchange glances. The younger one leans over and types something on a silent keyboard. Both turn and stare at me again. Their actions pique my deadened curiosity just enough to make me want to turn towards them but the turning doesn't happen. I am immobile, helpless. The older one now reaches towards me and [blackness]

Once again I come awake. I find I'm in newer surroundings. The ceiling is lower, closer; the tiles a different shade of off-white. I still don't mind these disruptions and their accompanying relocations. Why this lack of interest? Surely I should have more curiosity. What has changed me? Should I search for a cause?

I don't know. Maybe not. It seems like too much trouble. Although laziness doesn't seem to be the only reason for my inertness. There's also an aversion to knowing--

The Asian man and the young woman appear to be talking. At least, their lips are moving, but I don't hear them. In fact I'm now horrified to realize I can't hear anything at all. No voices, no beeping of instruments, no telephones chirping, no distant street sounds, no radio or television, nothing. Nothing but silence. I am overwhelmed at the appalling discovery, plunged into despair. How could I have failed to notice this awful loss? I am totally deaf.

My shock and dismay gradually diminish to a muted sadness. After another drifting time, a depressed period empty of thoughts or dreams, I rouse myself to summarize my disabilities: I can't move my head, and I can't hear.

Now I worry. What else is wrong with me?

A brief inventory reveals an even more appalling flaw: *I can't feel my body.*

Staving off my rising panic, I quickly confirm that I have no sense of my physical self, no awareness of the pressure of my 190 pounds on the bed or examining table. No feeling of warmth or cold. No itches or discomfort. No constriction of clothing or bedcovers. I can't feel how my arms and legs are arrayed. I can't tell if I need to urinate, or if I'm hooked to a catheter. I can't even swallow, or feel if I need to. Only a terrifying and mysterious lack of proprioception. It's as if my six-foot-two frame has been stolen from me.

I attempt to cry out, to plead for help, to scream--but nothing happens. I can't tell if the urgent signals made it from my brain to the muscles in my diaphragm, my jaw, my throat. I can't feel my face. Or move my eyes. Or feel if they are flooding with tears as surely they must be. I can't lift my head to look down the length of my body. I am frozen in position.

It's as if I'm nothing more than an assemblage of terrified thoughts--afloat, levitating in this silent, sterile room.

What the fuck is wrong with me???

THE DONOR

CHAPTER TWO

Six weeks earlier...

Hunched over his desktop computer, Marc Gregorio was at risk of turning into one of the thinking machines he wrote about. Or so he'd been warned by his cousin Vince. Thousands of hours on the job does tend to rewire a person's brain. The screen he stared at was responsive to his slightest whim, following the meandering path of his curiosity, magically leaping from page to page. It was as if his arms, wrists, hands and fingers were independent contractors, unsupervised by Central Command.

At the moment, he was checking on developments in robotics for an article he was writing. Though he was a science generalist, lately he'd been focusing on cognition, natural or artificial, and related subjects. He liked to think of himself as a brainy kind of guy. Sometimes he thought of himself as The Man With Two Brains. The one that ran the show, the other that stood aside and judged his occasional folly with bemusement or hilarity.

In the background, noticed only occasionally, his excellent sound system reproduced an early Beethoven string trio. Music whose optimism and brio he'd selected from his vast collection in hopes that it might raise his spirits, trigger a new beginning. It was six months since he and Nicole ended their four-year relationship. Time to restart.

A pre-set alarm sounded, shutting down several mental circuits and shifting his focus to the here and now. He caught a whiff of his humanity. *Whew.* Time to shower and get dressed. He had a party to attend--for which he blamed his cousin.

Vince, having adopted Marc as his "project," had dragged him out to a bar a few weeks earlier, where they'd run into and paired off with Alison and Claudia, two of Marc's graphic artist friends. The girls worked for AutoCognition, one of the magazines that ran Marc's pieces. The publisher was throwing a party. Marc had ignored his e-vite until Alison reiterated the invitation in person. She insisted it would be fun; that it was just what Marc needed to heal his bruised and still-aching heart. Marc suspected the "running into" thing was a put-up job.

Meanwhile, Vince and Claudia had fallen in lust. This may have been an unintended consequence of their plot. Marc was bringing Alison, though technically, she was not his "date."

He selected his attire with uncharacteristic care: a black silk turtleneck, tweedy dark brown sports jacket, tan slacks, socks without holes, shined shoes. This first foray into the social whirl since Nicole's departure filled him with a jumble of exhilaration, trepidation and hope.

Dressed, he stared blankly at his reflection. He hadn't shaved in three days. Should he peel out of his turtleneck and take care of that chore? He decided against. His darkened cheeks seemed to confer a certain air of machismo. Would it fool anyone? He scoffed. Unlikely.

Alison, his non-date, had donned a predatory veneer: makeup brighter, hair done up in a mass of fiery curls, a red strapless dress to match, and a scent so pungent his eyes teared up.

"Wow," he opined.

She favored him with hard-edged mirth. She was in full huntress mode.

The party was at Terra, a San Francisco event space located south of Market Street in a trendy part of town between the Giants baseball park and the Moscone Convention Center. As they drove there, Alison said that the publisher had specifically invited some young singles to keep the event from degenerating into a scientific gab-fest. Appraising him from the passenger

seat, she said, “You look okay. Please try to act interested, interesting, and maybe available.” She knew his geeky heart all too well. “I see you left your iPad at home. That’s a good start.”

He escorted her into the vast and echoing space and paused a moment as many pairs of eyes swiveled in their direction. Alison stepped away from him, as if to make it clear that they were not really together. Several of the men showed interest.

Surveying the milling masses, Marc recognized some of the scientists featured in one or another of the publisher’s many magazines. He’d interviewed several of them.

Alison said, “There’s Bob.” She tilted her head in the direction of her editor, Bob Abelard. “Who’s that he’s talking to? Yum!”

Marc sized up Abelard’s companion: tall, slender, intense-looking, with piercing eyes, and deep grooves that formed parentheses around his lips. Her type, evidently.

But then she spotted her friend Claudia and split off, shooting him a look that said, “Okay, pal, I’ve brought you here: the rest is up to you.”

Marc didn’t see Vince. He snared a glass of wine from a passing waiter and was looking for a place to hide when Abelard waved him over. “Marc! Let me introduce you to Mitch Roszak. Mitch is Editor-in-Chief of Cognitive Data.”

They shook hands. Mitch’s periodical covered a lot of the same material as AutoCognition, but more respectably, and with greater scientific depth. In fact, as a peer-reviewed journal, it was rapidly becoming the standard for cognitive research.

“Marc Gregorio,” said Mitch. “You’re something of an AI specialist.”

“Oh, I wouldn’t call it a specialty: more of a strong interest,” Marc said, adding, “I prefer real intelligence over the artificial kind.”

“Don’t let his modesty fool you,” said Abelard. “Marc is very bright—a genuine polymath.” He winked. “It’s true.”

To forestall further praise, Marc asked Roszak, “What’s new and exciting in your ultra-narrow slice of the science pie?”

Abelard used the opportunity to excuse himself. “I need to circulate some more.” He grabbed a cheese puff from a passing tray, winked and departed.

Rozzak sipped his wine, then offered his opening gambit. “What do you know about these new self-programming chips? With nanoscale logic gates using quantum Hall effects? There’s been a breakthrough using a new material that works at room-temperature.”

“You’re talking about graphene?”

Rozzak snickered. “Something better. Molybdenum disulfide. Unlike graphene, it has a built-in bandgap. They’ve gotten transistor gate lengths down to around ten nanometers. Which means they can squeeze five hundred billion transistors into a single square centimeter.”

“Holy shit.”

“Indeed.” Roszak launched into a discussion, diagramming on napkins. Marc was drawn in, adding comments, asking questions, utterly absorbed in the details.

After a time, Alison arrived, shooting Marc significant looks, eyes bugging, her lipsticked smile keen and covetous.

Taking the hint, Marc introduced them and regretfully backed away from the fascinating worlds of quantum computing and self-organizing chips in neural net arrays.

He finished his wine, a tangy peach-inflected white that might have been a Pinot Gris. He was heading towards the bar for a refill when another editor stopped him. “Hey, Marc, I was hoping you’d be here. Do you know Dr. Richard Kornfeld?”

“We met long ago.” They shook hands. Kornfeld, pale-faced and pot-bellied, with a neat salt-and-pepper goatee, had been awarded a genius grant by the MacArthur Foundation years earlier. “Your name came up recently when someone contacted me about a writing gig.”

“That’s right,” said Kornfeld.

“What is it you’re doing these days?” A vaguely distressing recollection stirred in Marc’s memory buffer. He edged away from a clump of scientists engaged in a noisy discussion.

“Still involved in cognitive research, and still heading up the Gideon Reese Artificial Intelligence Lab. But we’ve got corporate support this time.”

The warning bells intensified. “Have I heard of your sponsor?”

Kornfeld hesitated. “Possibly. It’s Memento Amor.”

“Dear God, say it isn’t so. You’re not helping *that* outfit?”

The editor, Michael Paling, laughed. “Marc can be brutally honest.”

Kornfeld had stiffened. His goatee bristled. “I’m their Chief Scientist. You’d be surprised at the quality of work we’re doing. You should come to the lab for a tour. In fact, come this Monday, if you can. We’re trying something you may find interesting.”

“That sounds great. I’d love the chance to catch up on your latest projects. Maybe Mike would run an article on it.”

Paling considered. “Possibly. No promises, of course, until I know more.”

Marc and Kornfeld exchanged contact information on their smartphones and shook hands. The familiar ritual reminded Marc of an old New Yorker cartoon: two men swapping business cards while their dogs sniffed each others’ butts. He proceeded to the bar for his refill, pausing to accept a skewer of chicken satay proffered on a tray by a pretty serving wench.

He knew little about Memento Amor: just that their reputation put them on the fringes, into the realm of pseudoscience. He was surprised Kornfeld had hooked up with the outfit. He made a mental note to look them up before he visited.

The chicken was a tangy delight. He discovered he was hungry. He’d skipped lunch, distracted by the robotics articles he was reading as background for a piece he planned to write.

In the distance, he heard what sounded like a Haydn string quartet and wondered: live music or canned. Curious, he started moving towards the sound.

“Hey, Marc.”

Marc turned to see his cousin Vince emerging from the crowd with Claudia on his arm. They were a physical match: both short and a tad stout. In his case, jowls and a beer belly; in hers, an enticing voluptuousness. They looked quite comfortable with each other.

“Hey, you two.” He gave his cousin a fist-bump and Claudia an air-kiss.

“I love this party,” she enthused, raising her voice to be heard over the buzz of chatter.

“It’s such a geek-fest,” griped Vince. “Have you ever seen so many in one place?”

“Watch it. I’m one of them,” said Marc.

Claudia objected. “Not by a mile. At least you’re cute.”

Marc’s eyebrows went up in mock horror. “After all the studying I put in, earning two advanced degrees and so on, that’s the best you can do?”

“What’s wrong with cute?”

“A puppy is cute,” snorted Vince. “Marc is just a weird fuckin’ brainiac.”

Claudia stroked Marc’s rough cheek. His skin tingled from the contact.

“So what? I still like him.” She stretched up and planted a kiss on his chin.

“Do you have a sister?” Marc asked.

“You wouldn’t like her. All she does is shop, read tabloid trash and pop her gum.”

“Plus she’s a plus size model,” put in Vince. “Cute as hell, but maybe more than you want to handle.” Marc’s previous girlfriends all tended to be slender and athletic.

“Is she really a model?”

Claudia nodded. “She has such a cute face.”

“So do you.”

“Hey, she’s taken,” said Vince with a scowl that looked dead serious.

Hands up, Marc backed off. He wondered if his cousin realized he’d just uttered words hinting at commitment. This after only a few weeks.

As the couple drifted away, he heard Vince complain to her, “I don’t like you flirting like that, even if he is my cousin.”

She put her arm around his ample waist, and he put his around hers.

A few minutes later, he spotted Alison and Mitch Roszak out on the balcony, shoulders touching, drinks in hand, backlit by the fog-softened lights of San Francisco. Them too? They already looked like soul-mates. He couldn’t help feeling a twinge of envy at Roszak’s easy conquest. Or perhaps surrender.

He was bemused at how easily the two couples had connected, and wondered if he’d again be willing to risk that kind of linkage with another woman, after the many painful endings he’d endured in his dating life. Nicole still haunted his dreams.

Yet only a few minutes after that, he saw an interesting face. Hints of Chinese genes, exotic cheekbones. She looked like a punk princess in her tailored red satin blouse with its raised collar, hip-hugging black slacks that flared below, shoes with razor points and stiletto heels, dark lipstick, and boyishly short black hair gelled into gold-tipped porcupine spikes. She seemed to be looking in his direction from the corner of her eye, a pensive dimpled smile on her face. Marc felt flattered.

As if he’d never failed before, he sauntered over. “See something you like?”

She blinked, said, “Just a second,” and turned towards him. “What?”

Her turn revealed an ear-bud and dangling wire. She was on her cell. Whoever she’d been smiling at, it wasn’t Marc.

He recovered from a momentary panic-stall and went on the offensive. “I’m sorry, I thought you were attending the party.”

She eyed him with coolness. “Actually, I’m not. I’m hired help, and I’m on break.”

While he floundered for a response, her attention reverted to the person on her phone.

“I have to go. Some guy is hitting on me.” She listened, laughed, protested, “--That’s not true!” Listening again, her eyes swiveled in his direction and narrowed. Moved down, then back up. “Not awful, I guess.” This with an almost invisible smirk. “--Anyway, I’ll try to see you guys tomorrow.” She removed her ear-bud and gave him her full attention. She appeared mildly amused, but with a prickly curl to her lip and a glint in her eye that warned of danger.

He perceived he’d be wise not to try jousting with this formidable-looking young woman. “Sorry, I’m not usually such a jerk. I saw you smiling in my general direction. Like an idiot, I mistook it for an invitation. I’m Marc Gregorio.”

Her defiant expression softened a nano-bit. “Molly Schaeffer.” They shook hands.

Molly. The old-fashioned name attached oddly to her postmodern persona. Her last name didn’t fit her Asian mystique, either. Maybe her dad was Anglo. Or maybe she was married. No ring, though.

“So you’re working here? Doing what? Catering?”

“I’m a musician.”

“Really. What’s your instrument?” From her outfit and hair, he was prepared to consign her to some amped-up electronica hell. So her answer delivered a little shock of pleasure.

“The cello. I’m in a string quartet, booked for the occasion. Maybe you heard the Haydn that ended our set?”

“I did. That was you, then.” His assessment rose from Temporary Diversion to Intriguing Possibility. Marc had always been awed by musical talent. Eight dogged years of adult piano lessons convinced him he had none. “Must be a nice way to make a living, if that’s all you do.”

“It’s not an easy living. For extra income, I give lessons to some advanced conservatory students. I’m also first desk cellist in the Athena Chamber Symphony.”

“They specialize in Eighteenth Century repertoire?” he guessed.

“Not entirely. We try to mix it up. Though the quartet is more adventurous.”

“Adventurous as in what? Bartok? Shostakovich? Elliott Carter? Schnittke?”

She arched an eyebrow. “We even do Beethoven.”

He feigned puzzlement. “Who?”

She snickered. He’d finally managed to hit a right note. He pressed his advantage. “Can I buy you a drink?”

Molly hesitated.

With an inward groan, Marc recalled the snippet of her phone conversation. No doubt she was constantly fending off guys hitting on her.

But after studying him for a time, she relented. “All right.”

He walked her to the bar, aware of her citrus-and-spice scent. Her caution kept him off-balance and bruised his ego. He didn’t usually encounter much resistance in social situations.

She requested a Cosmo. He got another wine for himself.

“What do you do for a living?” she asked.

“Write about science. Try to make it comprehensible and interesting for general readers.”

“So you’re what, a science groupie?”

She’d put him on the defensive again. “Not exactly. I do have a science education.”

“Glad to hear it.” She sipped her Cosmo. He noticed a tiny L-shaped scar just above a corner of her lip, white against the natural color of her flesh. At last, an imperfection.

“What got you interested in science?” she asked.

“When I was around eleven, I read a history of the subject.”

Her eyebrows rose a half-millimeter, inviting him to explain.

“What struck me was how nature, reality, the whole universe could be understood by humans.” Caught up by his own enthusiasm, and by her quickened attention, he went on. “When you think about it, how likely is it that upright hairless primates would come down from the trees and evolve a brain capable of such deep understanding?”

Molly nodded. She seemed intrigued.

Encouraged, he expanded on the topic. “Evolution actually produced people smart enough to figure out the rules that underlay the world.”

“You mean like Newton discovering the laws of motion?”

“Exactly. His laws seemed to lay out the whole story of the way things work.” He smiled at her, pleased that she got it, that she knew enough science to name the prime example. “His laws of gravity, inertia and action-reaction answered all questions; they made predictions that were testable, and were proven right every time, for over two hundred years.”

“Until Einstein came along.”

“Um--right.”

“And then Planck and Schrödinger and Heisenberg and the entire quantum mechanics crowd,” she added with the tiniest of self-satisfied smirks.

He just managed to keep his jaw from dropping. He was impressed as hell that a non-scientist, a woman--and a beautiful woman at that--knew so much. Then he chastised himself for his male chauvinism. “So you’re what, Madame Curie’s great-grand-daughter or something?”

“Just an ordinary educated person,” she sniffed.

“I wish more people were as up on science as you.”

“You want a larger reading audience?”

He laughed.

She checked out the crowd pressing in on them. “Science and technology seem to be the last refuge of the homely.” With a glance at him, she added, “With a few exceptions, I suppose.”

Grateful for this hint of praise, he looked at the people nearby. She had a point. They were an unappetizing lot, abounding with examples of poor posture, thinning hair and thickening features. “Judging by our surroundings, brains and looks seem to be inversely proportional.”

“Maybe when a young person has looks, he thinks, ‘why bother with learning?’” she said.

“That would explain it, I guess. So what made you such an overachiever?”

She pondered his flippantly-returned compliment. “I grew up an ugly duckling. Especially compared with my mom. So I took the learning route. Buried myself in books and music lessons. What about you?”

“I’m still more duck than swan.” He twisted his face into a hilarious grotesquery, an act of reckless confidence, considering her earlier reluctance to be a hittee.

“You’re right. I withdraw the question.” She hid a smirk in her glass. Her dimple made a brief reappearance. She was so cute he felt an ache in the region of his spleen.

“Do you often perform at functions like this?”

“It’s a gig. The money is nice. Unfortunately, our host is an aspiring Lothario.”

“He made a pass at you?” His eye flicked to her well-filled blouse and instantly away. He silently cursed his indelicacy.

“And him a married man,” she tutted.

“Who can blame the guy for trying?” Not Marc. Especially now that he’d spent time trapped in her orbit. Molly’s gravitational field was powerful, dizzying.

With a display of pique, she said, “He doesn’t know the first thing about me.”

“He knows you’re beautiful, and a musician, and well educated about science.”

“Are we talking about his opinions or yours?” Her mocking look made his scalp prickle with sweat.

While he floundered for a response, she gazed across the room and took a sip of her dwindling Cosmo. “I guess I shouldn’t have let his presumption annoy me. After the ugly split from my last boyfriend, I may have let my bitterness affect my view of other males.”

A deliberate disclosure? Maybe. Encouraged, Marc respond in kind. “That’s not really fair. But it’s understandable. When I got dumped, I couldn’t even look at another woman. It’s been six months. I’m still getting over it.” He was tempted to add, “Or was.” But that would have been too *faux galant*.

She looked him over. Was she inspecting him for hidden flaws? Maybe wondering what offenses he’d committed to warrant dumping? If so, she refrained from asking. Anyway, what could he tell her: inattention? Distraction? Was that his fatal flaw? Would it always be there to kill his relationships?

They strolled around the room together, maneuvering among the clumps of people,

chatting more easily. He was pleased and flattered that she seemed to tolerate his company.

“So what other interests do you have besides science and classical music?” she asked him at one point.

“I love old movies. The classic black and white ones, especially. I use Netflix to stream them when I’m not busy with work.”

“That’s a nice hobby. I like movies, too.”

Marc took in that information, wondering if it would be too forward to suggest they see a movie together.

Just then, Molly found the other musicians in her group. “Come on, I’ll introduce you.”

The Silicon Valley String Quartet was a local ensemble, he was pleased to learn. Their final set was coming up. “Stick around,” said Molly. “We’re doing Mozart.”

“That’s adventurous.”

She made a face. “Our host can’t abide anything written beyond 1800.”

A few rows of chairs had been set up for the listeners. Marc sat as the players assembled and checked their tuning. Wilson Blaine, the lead violinist, was tall and dramatic looking, with sweeping blonde hair that spread around his shoulders. Marc glumly imagined him and Molly making beautiful music together: rhythmic bedsprings with vocal accompaniment.

Perhaps a dozen partygoers sat for the free concert.

The quartet played extremely well, even though they didn’t have a paying audience to perform for. Clearly they cared about the music. Marc liked that.

The seats began filling in. Marc was pleased that his favorite form of music could still attract and hold so many listeners.

When the Mozart ended, he gave the performers a standing ovation. Molly acknowledged his gesture with a smile and an elaborate curtsy.

“You guys are really good,” he told her when she returned from locking up her cello.

“Thanks. The B Flat Major is one of our specialties.”

Soon Vince returned with Claudia. Then Alison swung by with Mitch Roszak in tow. Clearly Alison had made a conquest. They found an unoccupied table and sat together, eating salted nuts, sipping salted margaritas and vying for the cleverest jibes. It was a contest Molly won handily. Or at least Marc thought so, enjoying her deft and witty defense of liberalism, which echoed his own views. Vince, a city planner in the Mayor’s office, was a staunch conservative. The conversation was lively.

“I’m surprised you’re willing to work for this mayor,” Molly teased at one point.

“Jobs like mine don’t grow on trees.”

“They sure don’t. They’re paid for by the taxes you guys hate. Taxes also pay for the roads you use every day. Garbage collection. Schools. Street lights.”

“Yeah? Well who benefits from the National Endowment for the Arts?”

“Not me. It must be a plot to subvert America’s kids with Mozart and Mendelssohn.”

“What good is any of that?” he sneered.

Marc was appalled but not surprised by Vince’s stubborn middlebrow attitudes. “Poverty of the soul is worth preventing, don’t you think?” he offered.

Vince scowled.

As the discussion continued, Molly began to warm towards him, or at least accept him onto her Progressive team. At one point, he caught Alison gazing pensively at them. Molly noticed it, too.

“She likes you,” Molly observed after they moved on.

“Yeah, but not really. We’ve never dated or anything.” As he replayed that “or anything,” he felt his face heat up. But Molly merely smiled.

Marc worried he was monopolizing her attention, maybe boring her. While she went to the ladies’ room, he fell into a discussion with the editor Michael Paling and another writer.

When the other writer moved on, Marc asked Paling, “Have you heard anything from Walter Langley?” A warm friendship had developed between Marc and the photojournalist when they collaborated on several articles. Most of Walter’s work was done in war zones. “I’m worried about him. I’ve sent him several emails, but he hasn’t responded.”

The editor screwed his face up. “The last time I talked with him--this was months ago--he mentioned Kyrgyzstan or one of the stans.”

Marc grunted. But that was Walter. Fearless.

Paling nudged him. “You have to meet this character.”

A fiftyish man with a weathered parchment of a face, a picket-fence grin and a stout body stuffed into a worn tuxedo approached Marc with his hand outstretched.

“Marc Gregorio? Stanley Eldridge. We spoke on the phone a while back.” His voice was a smooth growl, gravel on brushed stainless, with the well-tuned modulations of a radio announcer. Marc instantly recognized it. Stanley was marketing director of Memento Amor.

“Of course. I just spoke with Richard Kornfeld.”

“Richard is doing some amazing work.”

“I guess I’ll see. He invited me to come to his lab next Monday.”

“Did he?” Eldridge frowned fleetingly, then his lips hoisted into a smile. “Excellent.”

“What’s the connection between Memento Amor and his lab, exactly?”

Stanley winked. “It’s complicated. You’ve heard of the FitzGerald Foundation? It’s providing significant funding for Kornfeld’s work.”

“That would be Gerald FitzGerald? Isn’t he some kind of venture capitalist?”

“He bought Memento Amor five or six years ago. A fascinating operation.”

“I guess it would have to be, to attract a scientist like Kornfeld.”

Stanley beamed. “That was my doing, actually. Not to blow my own horn, or at least not too loudly, I’m the fellow who convinced the company to change direction. A few years ago, I offered to come to work for him for a buck a year until sales start to climb.”

“Quite an offer.”

“You bet. After Fitz hires me, the first thing I do, I persuade Richard Kornfeld to sign on as a consultant. I start a newsletter, garner some PR and launch new advertising. In a matter of months, sales start soaring. FitzGerald becomes such a believer he agrees to dedicate a third of his increased profits into research.”

Stanley leaned closer. “I’ll let you in on a little secret: that research is about to pay off.” He sipped his wine, winked and added, “I got a nice raise out of it, too.”

“That’s one hell of a story,” said Marc.

“It’s only going to get better,” Stanley said. “I guess I’ll see you Monday.” He waved and wandered off.

Paling said, “It’s not often you find an ad man chucking a successful career and dedicating himself to science research. You might want to reconsider his offer to do some writing for them.”

“I’ll try to keep an open mind,” Marc said, just to be polite. He drifted away, eager to find Molly once more.

After a few minutes, he spotted her chatting with the publisher and his wife. As he took

in her alluring, almost voluptuous silhouette, he was swept by a surge of longing that ached within his chest and rose to the base of his throat. She caught him looking and waved him over.

He came, but her nearness and her exotic scent suddenly caused his inner geek to stir. His social skills scurried into hiding. He gaped dumbly at the frog-eyed, pudding-faced publisher who sported a bad comb-over. Shook his moist, mushroom-soft hand when it was offered.

Molly seemed aware of Marc's attack of awkwardness. After a moment, she made excuses to the older couple and led him away. When they came to a stop, she studied him with curiosity and what he thought was a hint of disapproval. "What happened to you back there?"

Marc didn't dare admit how she had captivated him. "I was struck speechless at the thought of that reptile having designs on you."

"As opposed to you, you mean?"

His mouth opened, but nothing came out.

With a faint scowl, she led him away.

Marc was in the men's room when Vince caught up with him. "That Molly is a pistol. I hate her politics, but she is so damn bright. And holy shit, look at her."

"She's amazing. I'd love to get to know her, but I don't know if she's interested."

Vince studied him in the mirror. "You're kidding, right? You're a regular babe-magnet."

"Bullshit," he laughed. Though his history did lend credence to Vince's envious assessment. Enough women were attracted to Marc that he'd learned to be careful to avoid unwanted entanglements. Alison came to mind. But Molly had humbled him.

He turned the subject to Vince. "What's up with you and Claudia? It looks like love."

"Nah! C'mon, whaddya talking about?" His cousin's usual bluster rang hollow this time. "Oh, she passed me a message for you. Alison needs a ride home. Like soon. She doesn't want to leave with Mitch. She really likes him."

Marc understood: she wanted to avoid an awkward scene at her door. Invite him in or turn him down. "Don't I always say easy sex can ruin a relationship?"

"Can it?" asked Vince with a faint smile. "I sure hope not."

Spring was definitely in the air. Vince and Claudia had been busy since they met.

He found Molly with the other members of her quartet. The lead violinist was setting up a rehearsal for the next morning. When they finished talking, Molly turned to Marc. "What's up?"

"I have to run Alison home, worst luck. I'd like to see you again. May I have your contact information? Or can I give you mine?"

She lightly replied, "My schedule will be pretty crazy for a while. The orchestra leaves for Europe in a few days. Why don't you come to our next local concert? It's at Dinkelspiel in six or seven weeks. Afterwards, you can come backstage."

He understood her rebuff: she barely knew him. "I'd love to see you perform again. What's on the menu?"

"Stravinsky, Mozart, the Bach Double. Check out our website. ACSym dot com"

Athena Chamber Symphony. He nodded. The Bach concerto was one of his favorites.

Alison strolled over. "Ready?"

"Yeah. Um, give me a second." He turned back to Molly and took her hands, noticing the calluses on the fingertips of her left hand. "So I'll see you in six or seven weeks. I enjoyed spending this time with you."

"Me, too, Marc Gregorio." She puckered up and leaned in, but turned at the last second, offering her cheek and an air-kiss. Late change of mind or clever tease? "I'll leave a comp ticket

at will-call. And I'll see you backstage afterwards. Don't forget."

"I won't," he assured her. He had already engraved the occasion on his brain.

Driving Alison home, neither said much. But when he walked her to her door, their hugs communicated mutual hope and encouragement. Alison and Mitch had certainly formed what looked like a meaningful connection. His own feelings hadn't been in such a muddle in a very long time. If ever.

His thoughts were on Molly as he drove home: the way she seemed to melt over her cello when the Mozart turned serious, her intelligence, her attitude, her teasing laughter when she nailed him with a verbal shot, the dimple that would show up when her smile softened. He hoped that with all her gifts, she also had a charitable and understanding heart.

He was crossing an intersection just a block from his place when a weaving pickup truck ran a red light at forty miles an hour and smashed broadside into his car.

CHAPTER THREE

I stare unblinking at the ceiling, forcing myself to assume a composure that is detached, otherworldly. I focus on assessing my situation.

How bad is it? Is my paralysis total, or can I wiggle a finger or toe? Is it permanent? What caused it? I may never know. Serious trauma can blot out the memory of the event itself.

A spinal cord injury could explain this total loss of body sense. But not the deafness. Or the fact that I can't even feel the set of my facial expression, or, I suppose, change it.

I can't even tell if I'm breathing!

I suppress my rising panic and try to calmly examine the data.

Fact: I can't feel the rise and fall of my chest.

Fact: I can't feel or hear air whistling through my nostrils.

Fact: I don't see or hear a respirator.

But I must be breathing, or I wouldn't be alive.

And I must be alive, or I wouldn't be here to raise the question. *Cogito, ergo sum.*

It's as if all the nerves in my body have stopped working. Except the large cluster of them at the top of my spinal column. I should be grateful. --Or maybe not.

Damn it, there's got to be a simple explanation for all this. Maybe there's a blind spot in my reasoning. If I haven't suffered spinal or head trauma, then what? I revert to the stroke hypothesis. Or aneurysm. Have I undergone brain surgery?

This now seems more likely. But since I have no way to confirm that hypothesis, I explore other possibilities. Meningitis? Polio? ALS? No: none of those diseases cause deafness. Where is Dr. House when you need him?

Dr. House??

This little quip gives me pause. My mood has actually lightened. I realize why. I've been energized by my attempts to solve this mystery. The human mind is a wondrous thing.

I continue my search. What else? Food poisoning? Did someone slip me some poison? An overdose of Botox? Do I have enemies? Have I fallen into the hands of a mad doctor? I reach for the ludicrous because I'm out of ideas.

Maybe I'll get a clue from something that happened in recent days or weeks. I search my

memories. I have nothing better to do: I can't even twiddle my thumbs.

Let's see.

There was a drive along a picturesque highway. I'm heading south in my Prius, down the San Francisco peninsula, among rolling green hills. I take an exit that wanders through a woodsy area. Two women on horses move down a path parallel to the road. It feels like a dream. Where am I going? I don't know. The mental journey is incomplete.

Another memory, from another time. I'm in San Francisco, trying to talk on my cell. The signal keeps breaking up. I move away from the building's shelter, across the busy sidewalk, into the wind, closer to traffic, struggling to find a clear signal and to hear over the street noises. I remember being overwhelmed with frustration, anxiety, self-pity. Who am I trying to talk to? A woman, I'm certain, but her identity escapes me. Nicole? Or one of my other failures?

A flash memory: a panicked run down a cement staircase, circling endlessly, landing after landing, my heart flailing in my chest, acrid smoke clogging my lungs. I'm descending through a high-rise of some kind. But where? I can't be sure. This has more the quality of nightmare than memory. Am I imagining the terror-stricken flight from the collapsing World Trade Center? That was over a decade ago, but it still fills a large space in my being. I'd had lunch with my sister Sophia at Windows on the World just a few weeks before the attack. She was starting her first semester of law school.

Another memory. This one not only feels fresh and vivid: it feels pregnant with implication. With a surge of hope I study it for answers. I'm at a party. I meet the editor of a scientific journal. Mitch Roszak. We have an intriguing conversation about something arcane and cutting-edge. I sense it may be important, perhaps even relevant to my situation. Why does my mind skitter away from specifics? Alison interrupts, silently demanding an introduction.

Later, Alison and Roszak are having a moment of communion out on the balcony, shoulders touching, drinks in hand, with lights, fog, San Francisco in the background. It all looks so romantic. I remember being struck at their easy connection, wondering if I would ever again have that ease with a woman.

Yet out of this gloom arises a vivid recollection: an attractive face with Asian-tilted eyes and exotic cheekbones. A punk presence with spiked, gold-tipped hair. She's a cellist. Her name comes to me: Molly Schaeffer. I recall her physical presence, her teasing sardonic wit, her powerful effect on me. The more time I spend with her, the more this attraction increases, to the point that I'm completely addled, smitten, awkward and tongue-tied by her nearness. Jealous of anyone who looks in her direction. Thrilled and flummoxed every time our eyes meet. As the evening ends, she invites me to a future chamber concert, to come backstage afterwards. It's a prospect I recall looking forward to with great anticipation.

I remember taking Alison home after the party. On my way home after that--a kaleidoscopic image of something ugly and violent.

A car accident! That must be it!

And yet--I have a hazy recollection of talking to the police afterwards. Of watching my wrecked car being towed away. Of limping home and seeing my bruised face in the mirror. Did the accident shake something loose? Have I suffered a delayed aneurysm?

I don't know. My mind drifts. Reverts back to my parting with Molly.

Now I have to wonder: Did I attend this concert? I don't recall. The date was some time around the beginning of May, but has that date passed? What's today's date? Have I missed it?

Even if I haven't, will I be in shape to attend?

Will I be released from wherever I am? Will I be able to walk? Will my hearing return?

Another memory. A rainy Sunday at home. I'm listening to Bach's Concerto for Oboe and Violin. For some reason, the piece has taken on new significance for me.

The music comes back to me now. The harmonies. The sumptuous blend of instruments. Sweet melodic tension that grows unbearable, heartbreaking.

With a stab of fear, I face the questions: Will I ever again hear music? Voices? Words?

Will I walk? Dance? Feel? Survive?

One of the men enters the barren, silent room. In a flash, I realize why he looks so familiar. *It's Dr. Kornfeld, from the party!* It's his recent tropical tan that threw me off. Several weeks must have passed since I last saw him. He stares at me with a puzzled, dissatisfied expression. He turns away for a time, thinking. He slowly turns back, looking like a man with one last, desperate idea.

He moves over to the keyboard that seems always to be nearby, just out of view. What's he typing? Notes about my case? When he finishes, he turns back to me with little hope. Then his jaw drops in shock. He stares for a moment, then rushes to the keyboard. He types briefly, disappears for a moment and returns with a thin sheaf of pages. He reads through them with growing excitement. He dashes from the room.

What's that about? My faint stirring of hope feels almost painful.

He returns with the others. They stare at me with incredulity and exhilaration. What's going on? Faces flushed, they gabble together all at the same time: a silent movie. At last they calm themselves and continue their discussion. Finally, the older man reaches towards me and I get ready for the usual blackout, but the woman stops him. They talk some more, and then the four of them go out, leaving me alone.

What has them so agitated, so thrilled? Am I improving? I hope so. The prospect of remaining like this is appalling. Given a choice, I would prefer oblivion over my current state.

It occurs to me to wonder if I have any way to express my preference.

Later, Dr. Kornfeld returns and gazes down at me with suppressed excitement and what I read as tenderness. I notice he's brought a bag. He reaches in, extends wires and moves towards me. He stops for a moment, considering. Then he looms larger, leans over me until my visual field is filled with the blurred texture of his polo shirt. Then blackness.

Music!

My hearing has returned!

With gladness so intense it borders on anguish I recognize Mozart's *Sinfonia Concertante*. The orchestra forms a delicate background as the violin melody slides downward until it is joined by the darker viola, the two instruments braiding together in a sound that is sensuous and lush. *God, but it's beautiful!* How was the miracle of hearing restored to me? Were my ears clogged? No, impossible: I'd at least have heard the sound of my own blood pumping. I'd heard nothing at all, yet now my hearing is sensitive, perfect.

I listen past the music and-- Yes, I hear the sound of air moving through the vents in the walls, the buzzing of fluorescents, the distant sounds of traffic, the nearer echoes of people talking in hallways and unseen offices or rooms, a telephone bleeping.

I revel in the Mozart, almost failing to notice the approaching voices: Richard Kornfeld has been rejoined by his colleagues. They stare at me with awe and disbelief.

Kornfeld says, "It was only a stroke of luck that made me realize the astonishingly rapid display speed was preventing us from seeing--"

"Slowing that down was brilliant," observes the older man grudgingly. He has a slight German accent. "Have you said anything to--" He glances in my direction.

"No, of course not."

The young woman looks concerned. "Good. This is pretty delicate. I think it has to be handled carefully." Her voice is deep and musical. I love her voice. All their voices.

Kornfeld's reply sounds defensive. "It's bound to be a shock no matter how tactfully it's handled. But he'll have to get over his initial response. Otherwise, how stable is--his condition?"

In the silence, the Mozart recaptures my wandering attention.

I become aware they're staring at me again. The older man says, "This goes beyond anything we'd hoped. Certainly anything I thought possible in my lifetime."

They share a serious moment. What have they done besides restore my hearing? *Is it possible they've found the cure for the rest of my problems?*

"Whatever happens, we've pushed the envelope," says the woman.

"We've ripped it to shreds," declares the Asian man solemnly. "Or maybe we've opened Pandora's box."

Kornfeld shoots him an anxious look. "We'll have to start writing this up," he says. "I only wish the other attempts had also borne fruit."

"Yes, so do we all," says the older man. "It would be wonderful to have several of them, not only for comparison purposes, but to see how they might interact and, and--"

The phone rings. The older man interrupts himself to answer. "Yes? --Oh, good. I'll send someone right out." He hangs up and says to the others, "He's here. I imagine he'll be pretty interested in our latest result."

The others laugh. The woman says, "Interested. Now there's an understatement."

Kornfeld stands. "I should go fetch him. I'm the one who got him into this." He leaves.

The vigorous third movement of the Mozart begins. The young woman frowns and moves out of my line of sight. The music suddenly stops.

I revel in the other sounds: the noisy effluvia of life I once took for granted.

After a moment, I hear a door open and they greet their guest.

The older man booms, "So glad you could make it on such short notice. You might not remember me from your last visit. I'm Hans Lascher, head of neuroscience here at the lab. This is Jan Robinson, my post-doc and colleague. And you remember Kenny Ng, who assisted in the procedure six weeks ago."

"Good to see you," says a voice I find strangely familiar.

The five of them come into my field of view.

My mind freezes.

The visitor is wearing my clothes.

And my face.

He is me.

CHAPTER FOUR

"Marc Gregorio, meet your twin. The result of the brain scan we did six weeks ago." Kornfeld gestured with jittery bravado at the monitor. Extending a thin sheaf of papers, he added, "This log covers its awakening, its first glimmers of awareness and subsequent developments."

Ever the skeptic, Marc examined the document. By the time he finished reading its dozen pages--what appeared to be the extensive ruminations of an awakening, self-aware entity--he felt like he'd been gut-punched. "The text was--was generated by this computer?"

Beaming, Kornfeld seemed as proud as a new parent.

Looking around, Marc recognized the two neuroimaging scanners that had been used to read his brain. They loomed in the back of the lab like malevolent spirits.

Hans Lascher spoke to Kenny Ng, who went to the troubled computer and shut it down. The neuroscientist seemed strangely protective of his new baby--as did the others.

Marc was fascinated yet repulsed. The idea that his own memories, his innermost thoughts, his darkest notions, his sickest fleeting impressions might be stored and accessible to this thing, and through it, to other people, filled him with revulsion and alarm.

But then his natural skepticism reestablished itself. You just don't find breakthroughs of

this magnitude at the impetus of a money-grubbing marketing outfit like Memento Amor, even if the funding was going to the Gideon Reese AI Laboratory. Was it a hoax? Were the notes he'd just read truly written by the computer? How else could there be access to his memories, his dreams, his experiences at that party? Including unspoken reactions.

Unless--had he somehow been hypnotized or drugged and induced to reveal his history, his recent experiences while undergoing the scan?

But why would they fake a breakthrough so significant? Surely they realized that any publicity would invite closer scrutiny, risking exposure and ridicule. No scientist could afford that. Nor could Stanford itself.

He turned to Kornfeld. "How is this even possible? And what about the other eleven subjects? Did you create a dozen mental clones?"

Kornfeld and Lascher exchanged a look. Kornfeld said, "The other scans failed."

"How do you explain your one success?"

Kornfeld looked as much irritated as disappointed.

Lascher put in, "Maybe the fact that you had been in a car accident just a few days earlier has something to do with it. Maybe the trauma you suffered did something to your brain. We're just not sure. We hope to gain some insight from further testing."

Marc drew a breath. His own involvement as a test subject was sheer happenstance. One of Kornfeld's dozen volunteers, an elderly Broadway performer, broke her hip just days before the planned experiment, leaving one slot open. Marc had volunteered to be scanned in her stead.

He'd undergone their series of tests, donned the wire-encrusted helmet, inhaled isotopic Helium₃ as part of the procedure, and made wisecracks in a cartoon voice.

Then they wheeled in the two neuroimaging scanners and hooked them up.

Once the process was underway, the scan ran for some two hours, producing not simply a 3-D snapshot of his Connectome, but in effect a video, showing the activity of his mind, his memories, his entire persona. At least, that was the apparent result.

With varying degrees of tension, the two scientists plus the Asian technician and the post-doc were all watching him to see how he was reacting to the news.

"From the file I just read, the--the entity has no recollection of the scanning process."

"No, it wouldn't," said Lascher. "The scan only collects long-term memories."

"Are you familiar with my work on evolving neural nets?" Kornfeld put in.

Lascher flashed a look of annoyance.

"I've read some of your papers," said Marc. He realized the two scientists were already jockeying for the greater share of the credit for their breakthrough. It was inevitable, given the stakes and the sizes of their egos.

He pulled his iPad out his briefcase. "I'm going to record this conversation, if you don't mind."

Kornfeld winced. "You understand we're not ready for publicity on this. You can record and write up your impressions, but I must ask that you refrain from publishing anything until we've had time to analyze the work. We wouldn't want premature claims to undermine any credibility we might have."

"If indeed we have any at all," Lascher added with a smirk.

"Fair enough," said Marc. He typed some quick notes and started recording.

"To continue, you know why I developed my original six-layer neural net and made sure the chips would have self-programming capability."

"To emulate the six layers of the cortex, I presume. As well as its functionality." Marc

had scoffed at the notion when he'd first read it, wondering: science or marketing?

"Recently," said Kornfeld, "we designed a new and more powerful version of those chips, carved from molybdenum disulfide layered with graphene to produce extremely small logic gates, and incorporating memristors. They're the heart of the learning array in this computer."

Memristors. Resistors that remembered their earlier values, offering cognitive-like properties. Marc had been quite excited to learn about them. Because they were non-volatile, their energy consumption was ultra-low, which meant there would be no overheating problem, either.

Kornfeld ran the numbers. Using the entire 12-inch wafer, six layers yielded over a thousand trillion transistors. The layers were sandwiched with five nanowire grids.

"The transistors use the grids to form their own interconnections. --At least we think they do. But we suspect they sometimes use other means: spooky electronics or perhaps quantum Hall effects. Somehow they find a way. They're self-organizing, evolving units. They can even grow new connections the way axons and dendrites grow and strengthen to form new memories. The wafer is a perfect mimic. It mirrors the scan input, creating connections of the correct strength as determined by the scan. A virtually perfect emulation of the subject's brain--his Connectome--in the wafer."

"So there's no programming involved." Marc pondered. "What about storage capacity?"

"Not a problem," put in Kenny Ng. "In theory, a single wafer can hold tens of thousands of times more data than there is on the entire Internet, plus all the books ever published."

An amount that boggled the mind. Marc saw the hunger in Kornfeld's eye. This work could prove him worthy of the fame he'd won when he was so young. Lascher, too, seemed eager for recognition. His large hands worried a paperclip. His nervous barked cough, his edginess, the suspicious looks he cast at Kornfeld, and Kornfeld's twitching, his facial tics were signs that their mutual distrust seemed ready to flare into open hostility. The colliding egos in the room all but set off electric sparks.

Despite the tension, Marc felt a twinge of envy. His own unachieved potential was an ever-present reproach. He glanced once more at the monitor screen, still dubious. "You're saying this *thing* is capable of independent thought?"

"Not just thought. Awareness. Sentience. Actual, measurable intelligence." Kornfeld added, "It started as a mere duplicate: your memories formed the substrate for its intelligence, its worldly knowledge--but in reality it's something new, and will continue to diverge from its initial condition as it matures and comes to terms with its potential."

"And with its limitations, of course," Lascher put in. "It's already worried about that."

Marc nodded. "All this seems a huge leap beyond the claims of your sponsor, Memento Amor. According to their web-site, they were striving to store the memories of an old person in such a way that after he died, his relatives could 'visit' with his spirit." He smiled at the notion.

Kornfeld reddened. "Our original goal was to take the memory *data* produced by the scan and combine it with a conversation engine so that loved ones could interact with the result."

Lascher strode over to the twin scanning devices and stroked them with affection. "Of course it was the high resolution of my 3-D orthoscopic scan that made all this possible."

Kornfeld forced a smile. "Yes, and with the huge capacity of our six-layer wafer, I had a strong feeling we could do much more than store a person's memories. We might actually achieve the upload itself." He turned on Hans. "That's why I insisted on including a scan of the brainstem. That's what handles the body-mapping. Your hero Tony Damasio says such body-

mapping is crucial to the formation of consciousness.”

Lascher flushed, broke his paperclip in two and dropped the pieces.

Kornfeld turned back to Marc. “For whatever reason, you were the lucky subject whose scan worked. But in theory, any normally intelligent person with worldly experience should also work. We don’t know why the other units failed. They’ve shown no responses at all.”

“Let’s get back to our one success.” Lascher walked over to the monitor. “While this unit has all your memories and all your intelligence, it’s not limited at that level. Not that your intelligence is low, ha-ha, but our device exceeds the number of synapses in your brain by a factor of many thousands. Given time, it should evolve considerably beyond you.”

“Great. We’ll have something to look forward to.” Marc gestured. “Why don’t you reboot it for another demonstration?”

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