



AN AURA  
*of*  
FAMILIARITY:

VISIONS FROM THE COMING AGE  
*of* NETWORKED MATTER



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INSTITUTE FOR THE FUTURE, 2013, SR-1590D

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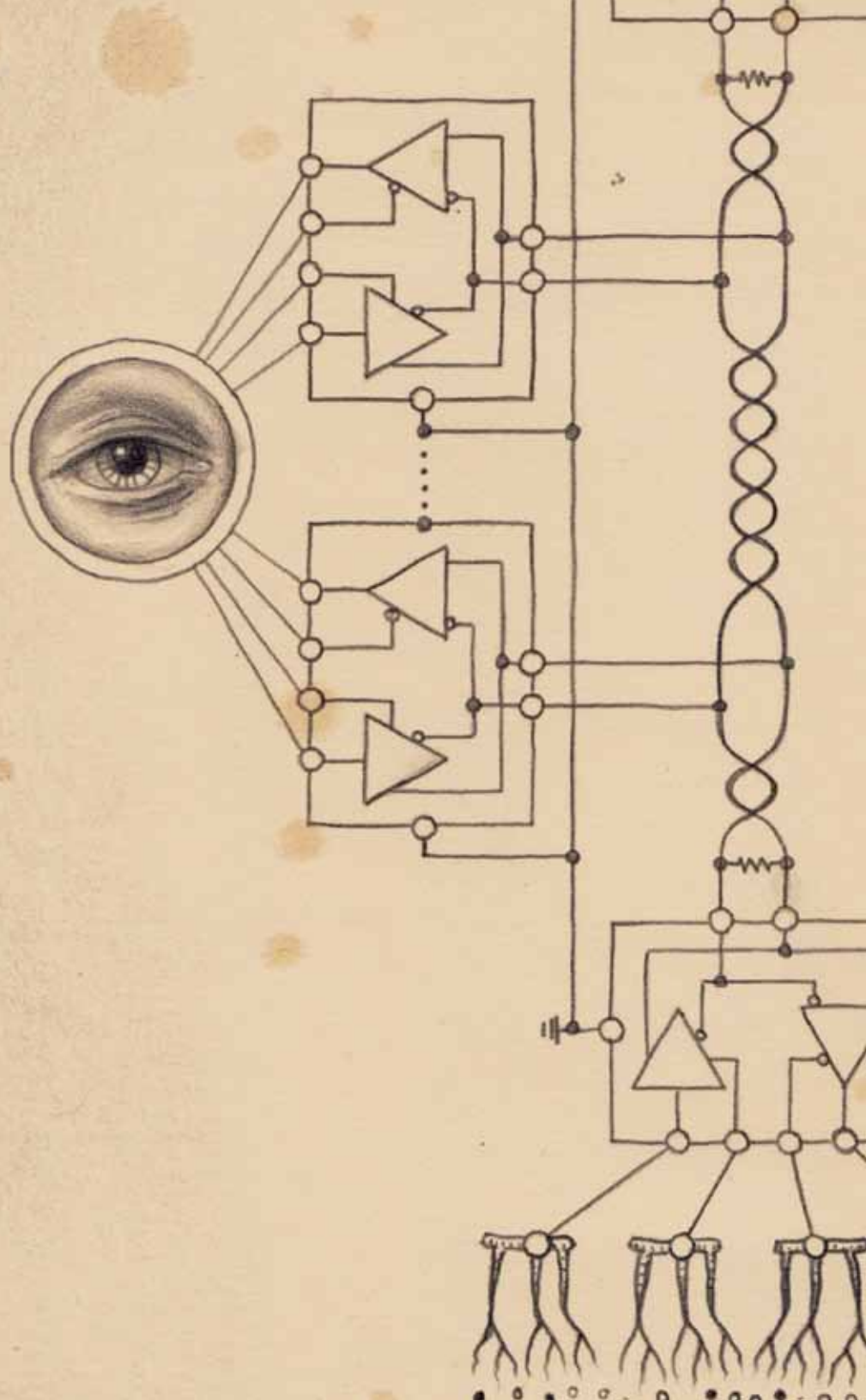
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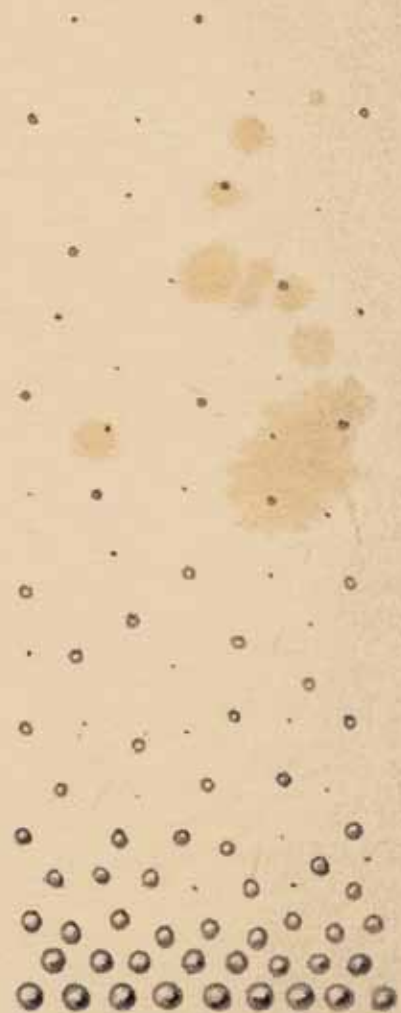
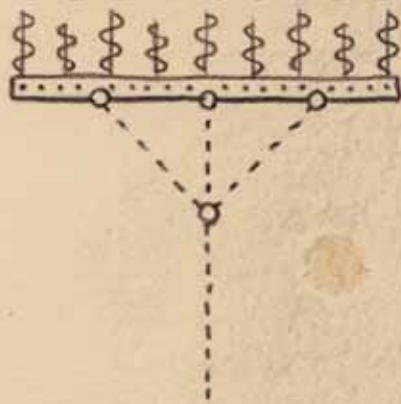
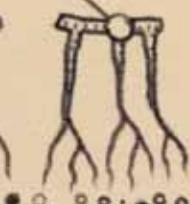
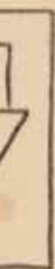


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# I.

## INTRODUCTION

# SCIENCE, ART, AND MAGIC

*“The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.”*

*- Albert Einstein*

**A**t Institute for the Future (IFTF), the Silicon Valley nonprofit think tank where I’m a researcher, we are constantly reminded that nobody can predict the future. In fact, if someone tells you that they can predict the future, you shouldn’t believe them. Especially if they’re from California. You see, one of the fundamental laws of futures studies is that there are no facts about the future. Only fictions. Our work at Institute for the Future is about exploring tomorrow’s fictions — informed by today’s facts — to make better decisions in the present.

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We do that by seeking out what we call signals — global events, scientific breakthroughs, technology trends, expert opinions — that on their own may cause you to raise your eyebrow in surprise but when observed as a complex ecology can reveal directions of major change. A signal is a signpost pointing toward the future. Recognizing the patterns and synthesizing the signals into a plausible, internally consistent story about the future is a strange brew of science, art, and magic. It's a decidedly human endeavor.

Some of us at IFTF find signals buried in academic technical journals or bubbling up from the DIY subcultures of the maker movement. Others immerse themselves in the venture capital community, studying the flow of investment dollars. Several of my colleagues use the tools of ethnography to understand how technology is changing the way people live in rural villages and megacities. I find many provocative and prescient signals by hanging around two very distinct but equally inspiring kinds of people — scientists, from gene jockeys to astronomers, roboticists to nanoengineers, and artists, from painters and performance artists to musicians and writers.

Art and science may seem like odd bedfellows, unbridled creativity at odds with logic and reason. Yet many artists and scientists run on the same fuel — passion, curiosity, and a sense of wonder about the world. Artists and scientists conjure up ideas through vision, intuition, and study, and use myriad techniques to manifest those ideas in the physical world. Indeed, the words “technique” and “technology” comes from *techne*, an ancient Greek term for “art.” Of course, the intersection of art and science has always been a fertile ground for experimentation, from Leonardo da Vinci to the early days of photography to the avant-garde Experiments in Art and Technology (EAT) of 1967, where Bell Telephone Laboratories engineers collaborated with fine artists.

But while science is constrained by the laws of nature, art is limited only to the imagination. It feeds the human quest for harmony and beauty. It is an opportunity for social inquiry. Artists often use their work to raise questions, criticize, or provoke us to consider alternatives and possibilities, many of which may not always be so positive. Art can shift our perception, changing the way we see reality. Art can be magic, sparking us to become change agents. And at its core, art is a form of communication, of storytelling. All of those functions make art a rich source of signals when developing future scenarios, and studying the myths and realities that will shape tomorrow.

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In 2013, IFTF's Technology Horizons program undertook a major research effort to forecast *The Coming Age of Networked Matter*, a time over the next decade where a confluence of breakthroughs in physics, engineering, biology, computation, and complexity science will give us new lenses to observe the systems, and networks of systems, around us and within us. We won't only observe these wondrous interconnections, we'll also modify and even create them in vivo and with purpose. The components of these systems will range from household objects with networked eyes and ears to tiny robots that behave like swarming bees to sentient cities that talk with context-aware coastlines. Whether it's through nanotechnology, gene therapy, geo-engineering, or yet-to-be-discovered interventions, we will interact with these natural and artificial objects to affect change at the system level. We will attempt to program our world for stability and resilience, even as we struggle with the unintended consequences of tweaking the knobs of reality. It will be an era of huge possibility, daunting pitfalls, and high weirdness.

For this work, we conducted expert workshops and interviews with scientists, engineers, entrepreneurs, and designers. We scanned science and technology journals to understand the technical underpinnings that would enable matter to network in new ways. And we also opened our eyes and minds to what artists had to tell us.

We commissioned six of our favorite writers of speculative fiction — Cory Doctorow, Rudy Rucker, Warren Ellis, Madeline Ashby, Ramez Naam, and Bruce Sterling — to write short stories tied to the theme of our research. Science fiction has always been a place of technological innovation, even inspiring real world inventions like the submarine and cell phone. We asked these writers to envision a world where humans have unprecedented control of matter at all scales, and to share with us a glimpse of daily life in that world. It was a process meant to make the future tangible. The product is in front of you right now. As you'll see, the content and context of each story differ widely, but the tales themselves are thematically consistent, hammering the hot-buttons of humanity: memory, connection, alienation, and what it means to be alive.

The visual art in this book is the work of Daniel Martin Diaz, a Mexican American artist whose exquisite style melds Spanish Colonial Art and Surrealism. Recently, Diaz found himself on a path startlingly similar to our own. For the last year, he has found inspiration in “the mysteries of consciousness, self-aware systems, philosophy, cellular automata, phase transitions, time

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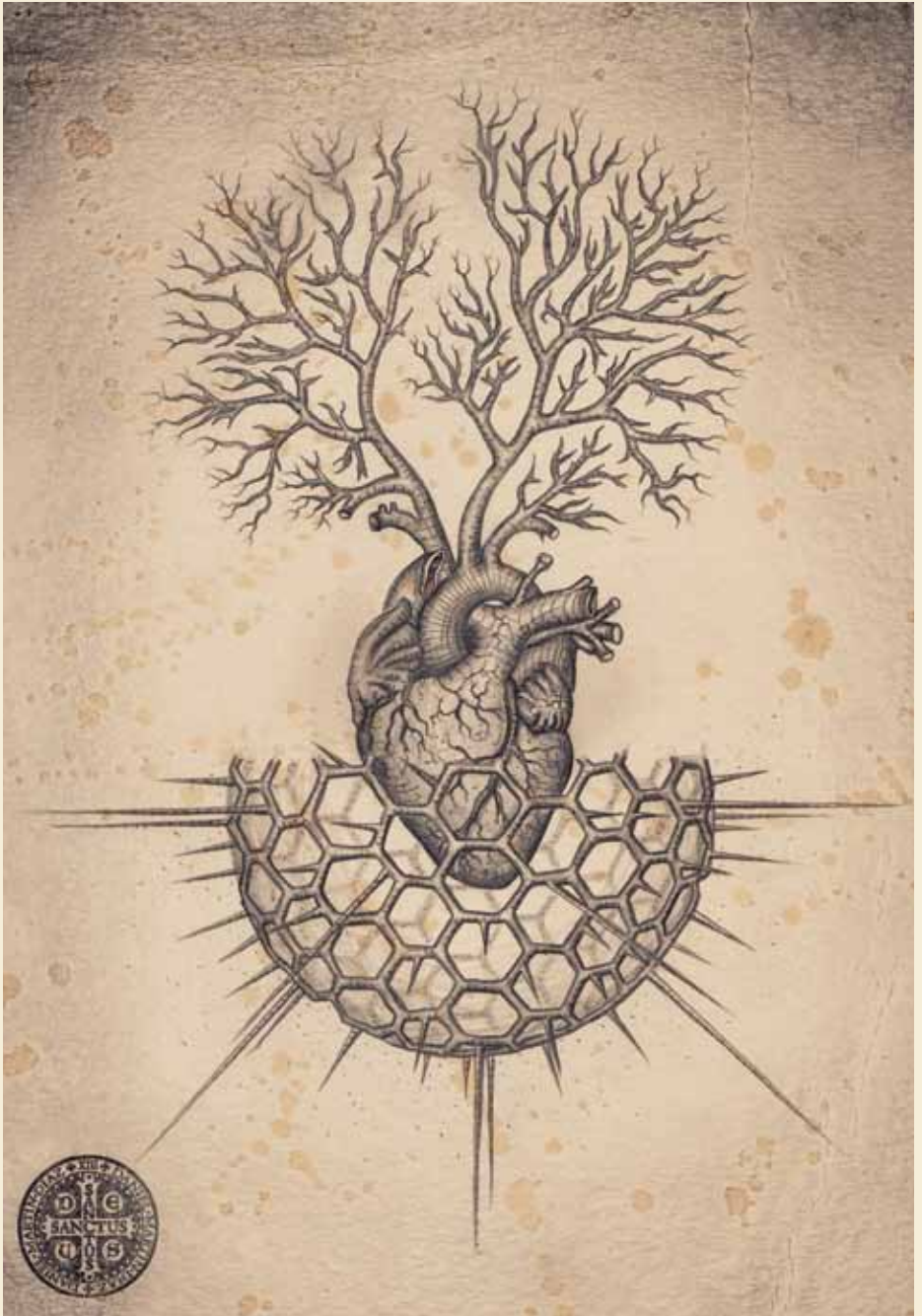
travel, and mystical behaviors at atomic and sub-atomic levels.”

The title of this collection, “An Aura of Familiarity,” was a phrase Rudy Rucker used during one of our workshops to describe the innate knowledge everything will have of everything else once all of physicality comes online. Of course, “aura” is also a term from magic that refers to the intangible quality or energy surrounding every person or thing. And that reminds me of Arthur C. Clarke’s famous quote, “Any sufficiently advanced technology is indistinguishable from magic.” To which science fiction author Gregory Benford later added, “Any sufficiently advanced magic is indistinguishable from technology.”

We hope you enjoy these visions from *The Coming Age of Networked Matter*.

- *David Pescovitz,*  
*San Francisco, April 2013*





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*Soul of Science*

DANIEL MARTIN DIAZ

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**II.**

**APRICOT LANE**

*by*

**RUDY  
RUCKER**

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“Julie went to yoga with Dan Joiner this afternoon,” said the girlish voice of Julie’s shoe. The shoe was a high-fashion item, a skintight flicker-cladding foot glove with a polka-dot finish, the shoe lying on the floor of our tiny apartment. Thanks to the Quarpet interface, the shoe’s voice was in my head, along with a flexible little icon that postured like a cartoon character.

“I don’t like hearing that,” I told the shoe, not out loud, just thinking the words. “Please be quiet.”

“I stepped on chewing gum outside the studio,” continued the shoe, ignoring my request for silence. “I wish you’d clean me with soap and water, and a stiff brush.”

“Use me!” urged a scrub brush from under our kitchen sink, its icon and its raspy voice also inside my head. The brush icon had rolling eyes; he wore his bristles like a silly mustache. I ignored him.

“Ask Julie to clean you,” I told the shoe. “Meanwhile she’s out jogging. To her office. There’s a big meeting.” Julie was a rental broker for Welsh & Tayke. These days more and more things were for rent. Efficient resource allocation. Handy because hardly anyone could afford to buy something new.

Another of our possessions piped up. Julie’s lipstick. “Actually, Julie is jogging to Dan’s car for a quickie. She was whispering to him on the net while I touched her up just now. She got so excited that she forgot to take me along.”

The lipstick’s voice was low, seductive, intimate. Its icon had a gossipy California-girl face with, of course, dramatically red lips. It seemed be done talking for now, but I wished I could permanently turn it off.

As of three days ago it had become impossible to deactivate an object’s voice and icon. This had happened after the latest Quarpet upgrade had self-installed onto all its clients and users. Objects were clients, people were users. All were of equal status now, each of us part of the Quarpet empire. We were supposed to get used to living with inner babble, and with Quarpet sprites filling our eyes.

It was sunny outside, April, late afternoon, with a sweetness to the damp air. I’d been sitting here with our front door open so I could look at the golden light on the concrete alley. Apricot

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Lane. It ran along the backs of some big houses that rented out their retrofitted garages and outbuildings, including the pathetic newlywed love nest that Julie and I had managed to lease for a ten-month term. A toolshed, actually. We didn't have any windows. Four months we'd been together in our nest, and now Julie's lipstick said she was cheating on me.

Cheating with her fellow rental broker Dan Joiner, no less. Dan was not a content provider, not an engineer, not a craftsman, no, he was a flipmeister like Julie, shuffling hapless users in and out of short-term leases that traded on the open market like oil stocks or soybean futures. I could forgive chirpy, chatty, oblivious Julie for her occupation—but there was no forgiving Dan Joiner, that hideously tanned hyena, unable to converse about anything other than business and sports, forever rolling his neck as if he were an athlete with an ache, seemingly unable to remember my name: Tuck Playfair. Dan acted like he was a big deal, but he earned so little that he lived in a car.

I myself did contract programming on Quarpet apps. Sometimes. I worked in my apartment when I had one, or in whatever coffee shop would let me stay, or, when it occasionally came down to that, I'd work in whatever car I was renting. When I had a car. And when I had a project to work on. Which I didn't just now. I hadn't made any money in six weeks.

The wheel of fortune spun faster all the time. Everything in the world was on the make. Everything was potentially a bully, a snitch, a shopkeeper, a do-gooder, a scammer, a marketeer, an enemy, a beggar, a bore, a landlord. It was still a little hard to grasp that objects could think at all. It came down to the fact that objects are full of jiggling atoms and molecules. And that makes for processing power.

I zoned out for a minute there, sick of it all, slackly watching the Quarpet client sprites swirling across my visual field. Julie's shoe, the lipstick, the scrub brush, my unwashed laundry, our sadly unused candelabra, stale breadsticks, can of anchovies, a dusty crystal vase, my sunglasses, my wallet, my keys, my now-heartbreaking locket of videos of Julie, the neighbor's garbage can, the slabs of concrete in our alley, the shingles on our roof, an empty bottle under a bush—all these things softly talking at me in likeable and interesting voices.

"I'm in good shape, I'm in an unusual spot, I need maintenance, perhaps you should replace me with a newer model, you could

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sublease me, I was assembled in San Diego, put me in the trash can, do you still love me . . . ”

The voices of the sprites were modulated by a Quarpet app that I'd had a small part in. Quarpet's default voices were high and horrible with corny accents—a lamentable interface decision that emanated from Quarpet's ultranerd zillionaire founder Ned Ruscha, who had a thing for old-school TV commercials. Ned had bought into the idiotic notion that real life is cute—rather than unspeakably futile and tragic. Cute for Ned Ruscha maybe. Cute at our expense.

Human sprites mingled with the icons of ordinary objects. The humans were a little larger and brighter. If you were online, your sprite tended to model your current appearance and activity. Julie's sprite, however, was dim and motionless. Offline mode. I didn't have the heart to call her. Didn't want to open a data gate into a foul, writhing quickie with Dan Joiner.

But maybe Julie's lipstick had been wrong. Or maybe the lipstick was staging a vendetta against me. We now knew that the molecular vibrations of any object could embody a human-level intelligence. Maybe the lipstick had it in for me because I was broke. Maybe it wanted me and Julie to break up.

The official line on the latest Quarpet upgrade was that objects would behave in more productive ways. “A world at work,” Ned Ruscha had said in the promo announcement. “Helpful genies all around. Comfortable control.”

Maybe, from Quarpet's viewpoint, it would be a better world if I stopped living with Julie. I was a parasite, an underperformer. And—another angle—it was well known that the Quarpet organization didn't like freelance apps programmers. They would have preferred to control the interface ecology themselves.

Maybe I was getting too paranoid. I took two cans of Julie's beer from our fridge and walked outside. The twinkling Quarpet icons circled my head like a ragtag rabble of paparazzi, like bill collectors on my case, like horror-movie toys crawling after a doomed kid. Once upon a time I'd had private memories, personal possessions, my own life.

As I got farther from the toolshed where Julie and I lived, additional sprites came clearly into focus. A power saw in a garage, a bird feeder, a shovel, a lawn chair, yellow sunglasses, a

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dark-haired woman lying on the chair and wearing the sunglasses. An actual woman named Cambria in shorts and a long-sleeved jersey. A friend. And single.

Cambria was a freelance Quarpet apps programmer like me. In the old days she'd been a physicist. And I'd been designing interfaces for charity fund-raising sites. But now Quarpet was all that mattered.

"Hi, Tuck," said Cambria. Her chair was wedged onto a strip of grass next to the garage that she rented.

"Yo, Cambria. The sprites and voices are eating my head. I'm going to the park."

"I'll come too." Cambria sat up and wriggled her bare feet into her flip-flops. "Where's Julie? In your opinion." Cambria was a friend of Julie's from high school. She'd clued us in about our toolshed's rental opportunity before the shed had even announced itself.

"Julie's doing a quickie with Dan Joiner at work," I blurted, wanting to externalize my pain, wanting to hear what Cambria would think. "Having? Enjoying?"

"Error code!" Cambria unleashed an explosive laugh. "Dan the foxy flipmeister with the baked-on tan. And now you know. Poor Tuck. Can I have that other beer?" Cambria was single.

Our tiny park was at the end of Apricot Lane. Thanks to the Quarpet upgrade, a lot of people were in the park this week, wanting some physical distance from their talking things. The only things in the park that talked were the playground equipment and the picnic tables. And people's clothes, and the stuff that people carried with them. Thus far, plants, animals, and insects hadn't been Quarpeted.

Yes, it was quieter in the park, although I could still faintly hear the things in my apartment. Matter of fact, I seemed to hear Julie's lipstick give a scream.

But never mind that. Cambria was perched next to me on a picnic table, talking to me out loud, her voice like rough silk. "Word is, the Quarpet upgrade is meant to be a major disruption," she said. "The always-on feature isn't going away. The client objects have clear-channel access to everything, all the time, forever, with no firewalls, and they're under Quarpet control. No more quantum

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entanglements with each other. Divide and conquer. You know what I mean?"

"I know that you're a geek with low empathy," I said. "But maybe that's comfortable for me. Like lying in the mud." I had this sense that my life as I'd known it was ending. I could say whatever I liked.

"Are you saying I should be talking about Julie and Dan?"

"A little," I said. "Let's open these beers."

"Your blood alcohol level is in the normal range," said my beer can's voice in my head. Its top split open like a molting lobster's shell. I was allowed to open the second beer as well, and I gave it to Cambria.

"If a can senses an irregularity, then it won't open, and if you force your way in, it lists you on the online I Need Help page," said Cambria. "And then maybe a freelance social worker tracks you down. Or a vigilante. I was on the team that wrote the beer-can app. What did you ever see in Julie, anyway?"

I pulled at my beer, enjoying the cool tingle in my throat. "I used to feel like she needed me," I said. "She's unsure of herself and I'm nice to her. I validate her. And in return I feel validated. I have a purpose. Even if I'm not making money."

"What is love?" said Cambria. "You ever wonder about that?"

"I like the sound of Julie's voice. The way she smells. We enjoy kissing."

"To be expected," said Cambria. "Little-known fact: love is physics. Love is a form of quantum entanglement. Your wave function and Julie's wave function are merged into a single wave function. She's you and you're her. One flesh. At least that's the way it's been. But now—"

"Now it might be over," I admitted.

"*Sooo . . .*" said Cambria. "Do you feel any quantum entanglement with me?" She had a pixie face and lively eyes, faintly visible behind the amber lenses of her shades. Her expression was friendly and a little amused. Maybe she was gaming me. With women I could never tell.

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“You’d move in on Julie’s man that fast?” I asked.

“Just trying to make you feel wanted,” said Cambria. “Two alligators lying in the mud.” She waggled her pink tongue and winked at me.

“What’s the wink?”

“Maybe I’m testing your loyalty. For my friend Julie. Julie’s shoe tells you what Julie does, but your shoe tells Julie what you do. The shoes are all spies now. Working for Quarpet.”

“Because of the upgrade?” I said.

“Yeah. I guess I’m more in the loop than you. I met with an apps broker today, angling for a gig. He didn’t want to tell me much, but I got the facts from his shoes. About objects becoming lovelorn cogs working for the Quarpet empire. Like us, in a way. Everyone out for themselves. In thrall to a voice in the sky.”

“You’re saying that’s because of less—quantum entanglement? The objects don’t love each other anymore?”

“Dig this,” said Cambria, gesturing in the air, pointing into our shared mental Quarpet space. “Disentanglement on parade. See the sprites goose-stepping around like soldiers? The picnic tables and everyone’s shoes and clothes. All together, with the commands coming via official Quarpet channels. Hut-two-three-four. A world of slaves.”

“Their voices are synched too,” I said, cocking my head. “Like a stadium full of fans. An armored tank that’s made of ants.”

“Guess what the tank is gonna enforce,” said Cambria. “Not so nice. *Universal monetization.*”

“How do you mean?” The phrase filled me with foreboding.

“Julie and Dan Joiner know. They’re rental brokers. Surfing the wave.”

As if cued by Cambria’s intro, Dan and Julie came walking into the park, heading straight toward me. For a moment I couldn’t make out their expressions—what with the low evening sun and the throng of sprites in my eyes—but then I could see Dan and Julie were expectant, smiling, keyed up.

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“Dan and I were *not* having sex,” said Julie, running the last few steps. “Not really. My lipstick is a big liar. I pounded her flat with a rock.”

“I’m still talking,” said the crushed lipstick tube in my head. “Julie can’t shut me up. She’s the one who’s lying. She’s redefining *sex*. You should leave her.”

“The whole staff of Welsh & Tayke had a business meeting,” said Dan, rolling his neck like a football fullback. He had his arm around Julie’s waist. “Ned Ruscha acquired our parent company. From now on, everything charges rent. And Quarpet is outsourcing the real-time pricing to us.”

“To you, Dan?” I said. “You’ll program the apps?”

“It’s not about *programming*,” said Julie, smiling up at Dan. “It’s about *mentoring*.”

“Who mentoring who?” I demanded. A balloon of fury was rising in my chest.

“Us mentoring the Quarpet client objects,” said Julie with a sincere nod. “We brokers can size up the values of things, you see.”

“We read vibes,” said Dan. “Intuitively. In the blink of an eye. The objects will be rookies on our team.”

“Rentals will be automatic,” said Julie. “You help yourself to whatever you want. And the things decide how much to charge. Micropayments.”

“Maybe a hundredth or a thousandth of cent,” said Dan. “Thanks to our coaching, the objects will know how to optimize net returns.”

“Universal monetization,” said Cambria with a sigh. “A sidewalk. A fork. A chair. A doorknob. Even a picture on the wall. You look at it, you enjoy it, you get charged.”

“A smaller charge if you don’t enjoy,” said Dan quickly. “Or maybe you don’t see the picture at all. Quarpet is rolling out a tweak for that, I understand.”

“Involuntary selective blindness?” said Cambria. “Wow. Like burning out a debtor’s eyes with a hot poker.”

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“The world’s a sliding-scale buffet,” said Dan in a comfortable tone.

“And no fibbing about what’s on your plate!” added Julie. “Our shoes keep us honest. It’s all worked out.”

“Flying on that magic Quarpet,” said Cambria. “Ain’t it great?”

“Let’s back up a minute,” I said to Julie. “Why did you rush to the park to talk to me?”

“I—I saw an opportunity,” said Julie. “Your shoes told me long-distance that you and Cambria were here drinking beer and flirting, and I’ve been feeling like we two are over it, and you haven’t been earning, and Dan’s tired of living in his car, and his and my incomes are sure to go up now that we’ll be Quarpet client mentors, and—”

“Julie really did have sex with Dan,” said one of Julie’s jogging shoes just then. “In the broader sense of the word. In his car right before the meeting. A quickie. It’s better if you know.” The shoe was smug and giggly inside my head.

I considered this for a moment. Unbearable. “Over it,” I finally said, echoing Julie’s phrase. “I’ll miss you, baby.”

Another pause. And then I turned to Dan. “So go ahead, fine, move out of your car and into our toolshed.” I lost control and my voice rose to a shout. “Make yourself at home, you baked moron!”

“No offense!” said Dan. “I’m grateful to accept your generous offer, uh . . .”

“Tuck!” I screamed, the cords standing out in my neck. “My name’s Tuck! I’m somebody! I’m a man!”

“You’re cute when you get all red,” said Julie. “This doesn’t have to be permanent. I heard you talking to Cambria, and it’s true, you do make me feel validated sometimes. Maybe we’ll stage a comeback one day.”

“But first Tuck moves in with me,” said Cambria, nudging my arm.

“You see?” beamed Julie. “Everything’s perfect.”

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So that was okay, in a way, although Cambria's bed didn't like my credit, and I had to sleep on the floor.

Suicide rates shot up over the next week, not to mention murders, assaults, and psychotic breaks. Universal monetization was particularly hard on those who had no money. Up to a point, you could run a tab, eating into your credit. But once you hit a certain strict limit, the Quarpet client objects would curtail your services. They wouldn't so much as advance you one extra thousandth of a cent.

It was fun living with Cambria—while it lasted. I liked her voice and the way she smelled. And her laugh. She still had an app job to finish, and I helped her a little. The app was about tracking how many objects were watching you. Not something that Quarpet wanted people to know, but there was a market for the app anyway. The programming related to Cambria's quantum mechanics thing. When an object was watching you, it made a very slight disturbance in your personal quantum wave function, and you could notice that. In some weird way, working with quantum processes was the same as learning to think in certain ways.

I helped Cambria with her new app's interface, and she gave me a little cut of her delivery payoff. But most of my money was gobbled up by my online creditors, and a day later my credit was maxed out again. Cambria's possessions were harshing on me for freeloading. She couldn't take it anymore. I had to go.

"I'm sorry, Tuck," she said as she sent me out into Apricot Lane. "You're cute, but I'm—"

"Semi over it?"

"*Not* over it. We're fully entangled. But it's inconvenient." Her door closed.

The concrete paving slabs of Apricot Lane set an insufferable beeper to running in my head. I didn't have a lousy hundredth of a cent to pay for walking on the street. I scooted over to the dirt edge, made my way to our little park, and flopped down in the shade of an oak tree. Thinking I might look for work, I peered into Quarpet space.

What I saw was feeble, but at least I saw *something*. There was no way to turn off a person's access to the net. The net was like air or light, a low-level physical phenomenon. So, yes, the

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Quarpet clients were still there for me to see, but their icons were dull text labels. And they stayed silent when prodded—or at best spoke to me in sullen monotonous. And the standard search apps weren't working for me at all.

Even so, I wasn't entirely helpless. I was, after all, a Quarpet apps programmer. To start with, I needed a way to disable the insufferable beeping of, like, an unpaid slab of pavement that I might want to walk on. I began doing some work on the problem, lying in the shade, looking up at the oak.

In their slow search for light, the oak's branches had grown into lovely, twisted patterns. The bark was a mossy maze of mites and cracks. The spring-fresh leaves traced chaotic paths, nodding in the breeze. These weren't things I normally would have noticed. But in some odd way they were helping me design my app. Nature was my last resort. And maybe I was hers.

"I'm thirsty," said a guy lying near me. A fellow bum. His name was Carlo.

"No hope of the park's water fountain working for us," I said. "But there's a creek in that gully down there. I've seen dogs drink out of it."

"What about food?" asked Carlo as we knelt by the stream. "Eat minnows? Slugs?"

"Let's hit some garbage dumpsters," I said. "Behind restaurants and supermarkets." All of a sudden, I'd finished my anti-beeper app. Thanks to the quantum jive that Cambria had taught me, it hadn't been all that hard to write. My app was like a meditation technique.

"The dumpsters are gonna scream shrill in our heads," fretted Carlo. "The sidewalks and the streets, too. We can't even leave this park."

"BeepBeGone," I said, wrapping a container around my app. "Here, I'm passing you a copy on the net."

I couldn't exactly charge money for BeepBeGone, given that it was for penniless homeless people. So I made it public domain. It spread fast. The next day, bums all over town were walking the streets and eating garbage in alleys. A few merchants chained up their dumpsters or poured bleach onto their leftovers, but most people felt sorry for us and let things slide. Nearly everyone had

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a friend or a relative whom Quarpet had cut off.

But we still had to sleep in parks or in the boonies. If you tried sleeping anywhere else, the Quarpet response went beyond beeping. The sidewalks called the cops. Or maybe the vigilantes. Even if people didn't want us to starve, they didn't want us underfoot.

The vest-pocket park by Apricot Lane grew crowded, but I still liked it. It was close to where Julie and Cambria lived. I had my spot under my favorite oak tree. I spent a lot of time lying under that tree, imagining new kinds of bum-friendly apps—but feeling like I wasn't thinking big enough. What we really needed was to roll back the recent Quarpet upgrade—the one that had made objects less mellow.

Although Julie was still tight with Dan Joiner, Cambria came and visited with me every night. For a chat, or even for sex. She half wanted to ask me back into her garage, but we knew her possessions would find a way to thwart me. The Quarpet tweaks were making the world meaner all the time.

"I finally have an idea for a way to help objects love each other again," Cambria said on my fourth night in the park.

We were lying together on a blanket that she'd brought from her house. I had BeepBeGone in my head to mute the blanket's protests at being lain upon by a pauper. It was dark. Cambria and I were practically naked. We'd just had sex and we were gearing up to do it again. Meanwhile we were talking about quantum physics and Quarpet app design. Not everyone's idea of romance, but that's the kind of people we were.

"We want objects to be quantum entangled with each other again, right?" I said.

"Love is the answer," said Cambria, caressing me. "My take is that we'll train the objects by example."

"Mentoring? By doing what we're doing right now?"

"We'd have to go further," she said. "We'd have to entangle ourselves deeply with some particular object. So it really really notices us. Show it the way. I'm hoping that'll start a domino effect. A chain reaction."

"So let's do it." I was ready to get back to our lovemaking.

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“But it’s dangerous,” cautioned Cambria. “Thin ice. Our personalities might dissolve and never come back. Not yet. Let’s wait till tomorrow. Maybe then we’ll save the world.”

“Maybe,” I said. “Darling.” We had sex, and I dropped off to sleep, and Cambria crept back to her garage.

In the night, Quarpet sprang a new upgrade. I heard a low-flying plane overhead, but I didn’t really focus on it. If anything, I assumed it was an anti-mosquito aerial spay routine. I’d later learn that the plane had deployed a mist of special-purpose molecules that parasitically affixed themselves to plants, animals, insects—and to human bodies. Tagging us all. Breaking down our quantum entanglements. Giving Quarpet central control. Divide and conquer.

When I awoke in the morning, I thought I was blind. Looking up at a somewhat blotchy sky, I didn’t see my oak tree overhead. Just a motionless vertical line. A placeholder. The oak was a Quarpet client and my vision centers were tweaked. It cost money to see the oak. And if you were a bum, the oak’s image was edited out.

“Fubar,” said my friend Carlo. He was on all fours, about twenty feet from me, running his hands across the ground. “No grass no more.”

Carlo didn’t look so good. His face was a circle with three black dots. His body was a sketchy skeleton like a crooked bunch of sticks. For that matter, my own hands were pathetic wireframe claws.

All the trees and bushes were gone as well, both in the park and all the way down Apricot Lane. Trees were lines, bushes were disks, and grass was black scribbles on the ground. The cawing crows overhead were arrows, the ants on the ground were stupid dots. A sterile world, a moonscape—if you couldn’t pay your bills.

I called Cambria on the net and told her about the change. She was still seeing okay. She still had some money. She dashed out of her garage and came running to me, a stick figure with a generic happy-face.

“Let’s do it!” she yelled. “The love merge!”

What with my Quarpet-caused lack of quantum entanglement, I hardly remembered what love was. But intellectually I knew it was the only safe place. I hadn’t forgotten our plan.

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The idea was that Cambria and I would lovingly merge our minds and flow into a nearby object. We'd provide a crystallization focus. Like a single speck of dust that turns a supercooled pond into a unified slab of ice.

We lay down at the foot of my oak, our arms tightly wrapped around each other, our minds in full communication via the net. We rubbed our bodies together like two cold sticks trying to make fire. I willed myself to be part of Cambria, prodded my wave function to superimpose itself upon hers—and, yes, the entanglement came back. Once again we were falling ever deeper in love. Her bland artificial features softened and took on the form of her playful living face. I kissed her.

“Now comes the dangerous part,” Cambria whispered into my ear.

We went for the old oak. We were inside the great tree's body—within its roots and pith and bark, feeling its juices, filtering through its inner channels, relishing the light upon its leaves. For a moment the tree remained cold and distant. Haughty. Possibly we'd extended ourselves too far. Conceivably our wave functions would collapse. Maybe we'd forget how to breathe.

Cambria and I focused our quantum waves, putting everything we had into sensations of love, all but dissolving into mindless white light, approaching a point of no return. And now the tree caught on. The oak's mind reached out to us, welcoming us into its world—quantum entangling with us, sending friendly ethereal roots into our souls.

We were on our way. The recrystallization had begun. Cambria, the oak tree, and I began awakening the Quarpet clients around us—the plants, the tables, and the sidewalks—reminding them to quantum entangle with each other, reminding them to fall in love. To obsess over each other once again. To forget about bosses on the net. To melt with tenderness and joy.

The wave of quantum entanglement spread across the planet in the blink of an eye. Once again things were their good old selves—merged into a convivial mutual reality, not giving a damn about Quarpet at all. Dumb as rocks and yet, in some wider sense, all-knowing and omnipotent.

It was a return to the garden of Eden, the garden we'd once taken for granted. Savoring the taste of a nearly forgotten freedom, the populace arose—and destroyed the Quarpet offices and labs.

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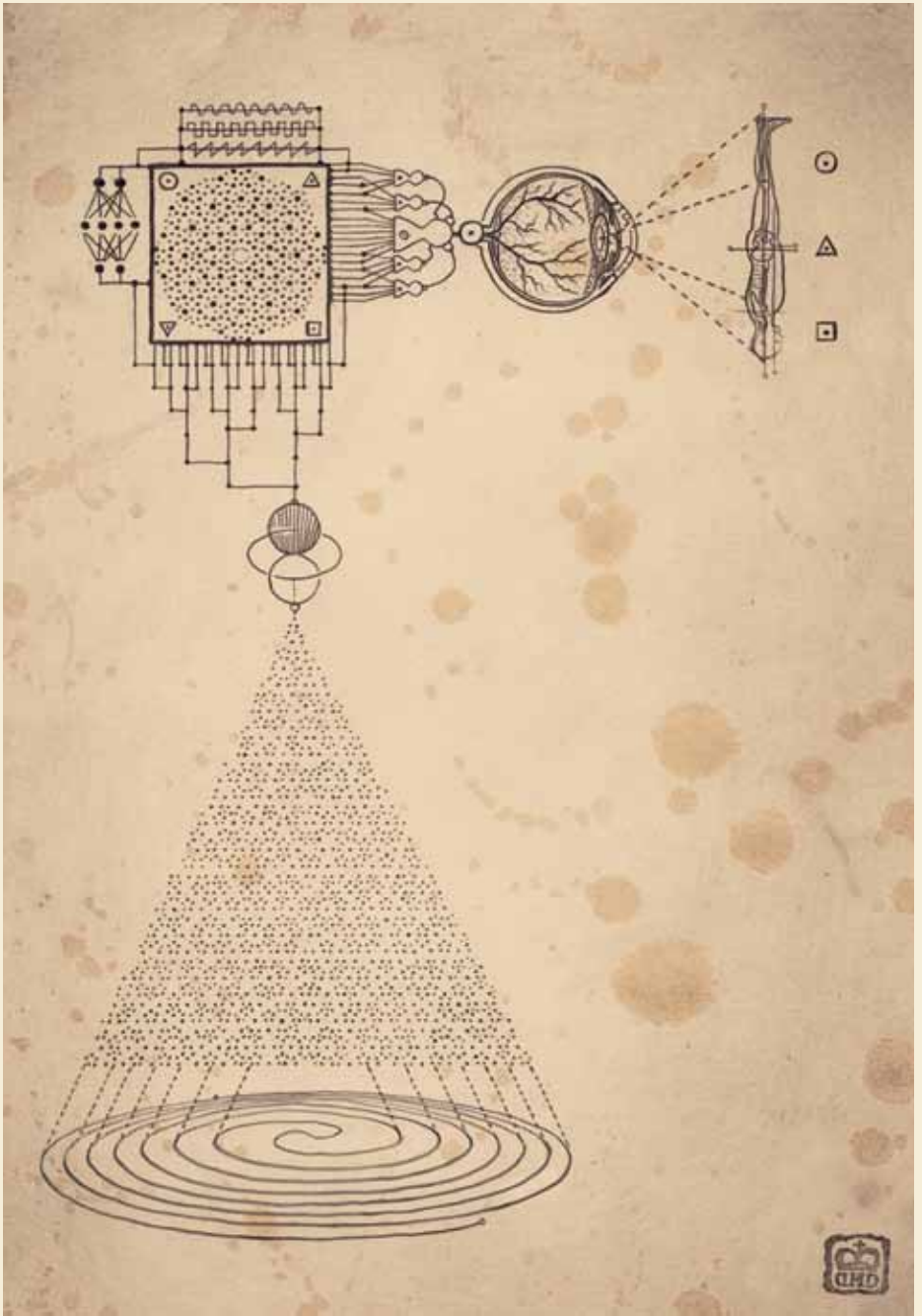
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Even the police joined in. Even the vigilantes.

And now? Dan and Julie are still together—they've repositioned themselves as old-school realtors. Cambria and I are setting off on a bicycle trek up the West Coast, starting from Apricot Lane and blogging as we go. We have quite a few supporters.

As for Ned Ruscha? He's been running a carnival puppet show, the last I heard. Carnivals are big again.



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*Binary Predator*  
DANIEL MARTIN DIAZ

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## *Lich-House*

BY *warren* ELLIS

The white room is bleeding to death.

A white vestibule, with white floors and white walls and a lit white ceiling. The only other color is red. A crack in one wall, exposing a raw fistula in the bioelectric packeting. Blood leaks from the hole, down three inches of slick white wall, to pool on the floor. A broken heart in the interstitial net of veins and wires that makes our houses live and breathe.

Somebody has murdered the house.

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Whoever it is, they are disguised in different blood. Human blood is networked. The intruder is wearing nine

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pints of a “dumb” perfluorocarbon emulsion, highly oxygenated. The intruder’s clothing is similarly stupid. Scavenged materials, hand sewn. Its security measures are dead, stabbed by the intruder, and it is bleeding out, but it can still see.

The house is not intelligent in any human sense. It has attempted to report its wound to the network. It does not understand that some form of help will be on the way. It simply reports, and logs the digital result of that report. In this instance, it has written that the local grid appears unavailable. This is not because of the hole in its wall but due to an environmental denial-of-service attack. The street, and much of its flora and fauna, are flickering on and offline. The house has begun to dump the record of its dying gaze into the storage vault in its foundations.

The house will die slowly. It will hold on for as long as it can and record as much as it can.

The house didn’t recognize anyone at the door until it was too late. Even now, with the intruder moving through the vestibule into the hallway corridor, the house is having difficulty gathering data on the figure. The intruder’s head and hands are covered in metamaterial sheathing, studded with ultraviolet LEDs.

The house, with its throat cut, cannot shout an alarm. Outside, it is causing the flowers in the yard to change their colors, petals turning fluorescent orange. This is the most it can do to signal a home invasion at this time. Inside, it grows more limited by the moment. The hallway is already colder. As the temperature drops, the house studies the intruder for hot spots, while pinging the outside world for a connection eighteen times a second. The house, in its chilly algorithmic way, will fight until it can no longer.

\* \* \*

The walls of the vestibule began to pit. Its flooring had gone gray and was taking on the texture of river mud.

The hallway carpeting almost imperceptibly rotted away, revealing complex systems of runnels incised into the flooring.

The intruder was in the living room now. The television wall was showing nothing but a swirl of RGB, its screen spasming in the corners, surface rippling and twisting. The sofa and armchairs were forgetting their shapes and were unable to log in to the cloud for a reset.

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The large Klimt curtains over the windows were an unnecessary affectation in the days of responsive glass. They functioned as simple still cameras, polymer lenses and plastic batteries in the weave, with a simple telephony aerial that'd get an image file out over the cellular air. Within a few minutes, the occupant's security service would receive a JPG of a figure apparently without face or hands, even these basic lenses entirely defeated by the intruder's imaging countermeasures.

The hot spots on the figure were now showing the house how the intruder dressed. This led the house to discover two epithelial cells on the cuff of the left glove. As the intruder stepped back into the hallway, the house was able to ping them, to no end. However, a third, longer epithelial was located in the back seam of the intruder's hood. This scrap of skin, caught in the seal and no more than three millimeters across, was networked. The hood had at the very least been handled by someone whose employment contractually required total tracking. When the house stroked it with a gentle wave of radio energy, it gave up its name and number. The house stored that in the hard vault. If the eDoS attack hadn't been in effect, the house may well have been able to track that cell's digital spoor across the network and into a human operating system. In serious circumstances, law enforcement decisioning systems could select cerebromedullospinal disconnection for that human to prevent flight previous to questioning.

Decisioning systems were not artificial intelligence. They were calculations of the network.

Not a concern for the human intruder in the house, of course, even if the street had been on the grid. The human in the house was aggressively non-networked.

The human occupant slept on. The house was unable to warn her. It was possible that the maintenance-related empathetic simulators in the occupant's body, which provided a general alert to failures in the house system, might eventually wake the occupant, but their effect was extremely low level so as not to impair the occupant's own ability to function. After a long day, a digitally generated sense of unease usually wasn't enough to rouse anyone from a night's sleep.

Power circuits were starting to give up now. The dining table had responded to a connectivity interruption of more than a moment by compacting itself. The dining room itself, noticing that its lighting was strobing, shut its light fittings off entirely

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so as not to disturb any occupants.

That room was empty. The intruder was in the kitchen. The electricity was already dead here. The fridge had gone to its power-cut setting, busy battery-run hands working inside it to strip and crush the foodstuffs within by animal and vegetable and order of expiration date. The packages were trying to signal their suppliers, with no luck.

The intruder walked back and began to ascend the stairwell. Her steps were just a little louder now because all the downstairs flooring was hard and resonant, its claddings wished away by the house. The vestibule walls were rotting heavily now, sliding from their frames and collapsing into thick, knobby cones before falling to the floor and deliquescing into the runnels that the mud had evanesced to uncover.

The intruder stepped onto the edges of each stair, as the strip of decorative carpet pinned down the middle of the staircase unwove itself, its soft strands of neutrally toned programmable matter breaking down into wisps of biodegradable anti-bacterial mist. The stairwell walls were dripping and pattering gently, and the trickle of liquid along the runnels and down into the containment bins under the house was getting louder. At this point in the process, the slow death of the house sounded not unlike some ambient relaxation soundfile.

At the top of the stairs, the intruder drew a weapon. The house, still with eyes to see through, zeroed in on it. It was a handgun. An offline handgun, and therefore illegal in this particular geographical location. The house was unable to consult a library about the weapon. Not that this would have mattered or made any difference. The weapon was actually a Colt M1911A1, a semi-automatic pistol designed in 1924 and used deep into the twenty-first century by the FBI and various special operations forces. There was nothing clever or beautiful about it in a modern sense. It had none of the immensely useful and impressive innovations of the contemporary world. It just killed people.

The handgun was in fact so simple that the house, in an ordinary moment, had more than a dozen ways to counter it. In the case of semi-automatic fire, the house could even have caused air molecules to clump into socks of matter dense enough to net the bullets before they reached a target. None of this could happen.

Up here, there were only three rooms. At the back of the house,

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there was the bathroom, darkened. Next, a second bedroom used as a storeroom, dark and its door wide open. At the front of the house was the master bedroom, wide and spacious, elegantly designed. The occupant preferred to go to bed with the door open just a little. In the first couple of weeks of the occupancy, the house had studied the fractions of that partly opened door and calculated an average. Since then, the house had taken care of that door. The house watched, and managed, the smallest parts of its anthropic usage. It made the occupant feel like her house liked her: that her house could feel and think.

The intruder entered the room, damp shoes on a hardwood floor. This was not a pistol that needed to be cocked. The safety, oiled and well cared for, slid silently under the intruder's thumb.

The wall between the dining room and the kitchen let go in a rush, a sudden river of wet matter hitting the flooring like a mudslide.

The occupant woke just as the intruder took another step into the room. The combination of sound and motion detection gave the occupant a jolt.

The intruder raised her weapon. The occupant slapped her bedsheet. The matter of the sheet remembered the strike pattern and collimated into a hard wide blade of something strong enough to take the impact of a bullet. It was purchased as a non-networked, last-ditch protective measure. It was often awkward and annoying. Just blearily groping around in bed for a dropped phone—some people still had cause for secure handset phones, some people had issues with soft eye cauls—could set the thing off, instancing a bedside tableful of things on the floor or a sharp smack in the throat. She brought her knees up to prop the sheet as she twisted around to pull her own handgun from under her pillow. The house's security systems, like the gun, were part and parcel of her particular form of employment.

The M1911A1 went off like a thunderclap. The bullet shattered on the sheet. The intruder fired again—the house could still see, and added its calculation of gunshot residue volume to its rolling report—and the sheet took the second bullet but cracked into three pieces a second afterward. The occupant already had her gun. She had closed her eyes during both gun flashes, and her night vision was relatively intact. She brought the gun up with a well-practiced straight-thumbs combat grip.

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The gun was networked. Modern firearms were capable of many wonderful things. A networked gun watched and listened to the world around it constantly in a variety of manners, consulting many different behavioral databases every second. Its own decisioning systems could select modes of response to a threat and even lock out lethal operations in non-lethal circumstances. It could kick out a nanosecond high-voltage electrical pulse over the air that would render the human target relatively safely unconscious for five to ten minutes. It could dial the impact yield of an explosive bullet down in accordance with information continuing to be revealed about the target while that bullet was in flight, turning a fatality into a nominally survivable wound. Or otherwise. Some state-of-the-art handguns used networked ammunition that could change their shapes in similar manner, flattening out for a stun strike or screwing into a hard point for armor penetration. Given the times, the disruptive nature of any informational technology and the sheer hot hellish tangle of the societal condition, networked firearms were strange legal miracles.

And when the network was down due to a DoS attack, they simply didn't work at all.

The trigger didn't even squeeze. The gun refused to operate because it couldn't find the network that granted it legality of use. It locked up.

The intruder put two bullets through the occupant's heart and two through the occupant's forehead.

The bed, dumbly, began to attempt to soak up the sudden spill of liquid.

The air scrubbers had already failed, and so bitter clouds of nitrate and soot circulated around the room. The house logged this, too. Gunshot residue was still almost impossible to wash off by conventional means.

The intruder turned at the acid, jagged sound of water pipes being withdrawn from the bathroom.

The floor scarred with runnels and tilted two degrees toward the staircase. A gentle camber to facilitate drainage. The bed shuddered, trying to process the corpse, and then died itself, forgetting its memoryforming and sagging like a euthanized lapdog. The walls began to bleed from ten thousand tiny pinpricks.

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The intruder had to wait for a moment longer to ensure her target was irretrievably dead. The occupant's onboard system was prevented by the eDoS from uploading basic audiovisual memory take, and the headshots should have destroyed her offline storage as well as her brain, but internal medical operations were tricky things these days. The heart was still twitching weakly, little red oil spills bubbling and leaking across the desert of the occupant's skin. The flesh did not knit over the bullet holes. The eyes did not judder with the telltale of secondary neural processing. The redness pooled and was still. The networked attributes inside her, still running off piezoelectric stores, would have been screaming for help. People like this had two deaths. The computing elements inside them took several minutes longer to go the way of the flesh. Right now, they were ghosts rattling inside a locked box of meat.

The intruder went quickly to the upstairs corridor, replacing the gun in her jacket. Along the hall, the bathroom was tearing itself down. A slamming of hard polymer doors indicated that the storage room was being sealed. The ceiling crackled, taking on a texture like wicker overhead. The house was gathering itself for its death throes. All the floors were cantered, the melting walls running through the channels underfoot toward the staircase. The stairs themselves had flipped in the last minute, reconfigured into a smooth ramp to ease the passage of the house's liquefying carcass.

The ceiling convulsed and tore open, releasing a torrent of fluid down into the corridor, splashing the intruder and making the floor even more dangerously slick. Even the intruder, at this point, imagined the dying house laughing at her, spitting its hateful revenge in its last extremity. Looking up in search of further dank waterfalls, she imagined for a moment that she could see the night sky through the ceiling. Five seconds later, she realized that that was exactly what she was seeing. The house was coming down.

The intruder attempted to make her way down the ramp in a slow and controlled manner, one hand on the wall and the other on the bannister. The hand on the wall sank in by an inch or so. It was like trying to find purchase in a vat of warm oatmeal. The bannister began to break up in her grip, damp compost in her palm. The sound of running water was starting to become deafening.

The intruder crouched like a skier and, fingertips on the wall for

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guidance, slid down the ramp in fits and starts, desperate not to fall backward or pitch over forward into the ground floor face-first. If nothing else, that could have torn the mask, and she had to consider that the house might yet have an eye working.

Foam jetted from the house's exposed bones. It was time for the structure's final teardown.

There was a sudden, awful explosion of noise, and a large gray box smashed through the downstairs ceiling and through the hallway floor. It was the storage room, retaining the occupant's goods and deploying them down into the foundation unit below the house for safekeeping. The place was heaving like a stabbed animal scrabbling for breath. The foam was dissolving the house's hard superstructure.

It would shortly begin to destroy the intruder's shoes and any other clothing it hit. It was also destroying the occupant's body.

The intruder drew the M1911A1 again and tossed it on the floor, up against the corner of the living room doorway. The foam would tear down the gun as surely as it would the rest of the hard superstructure, reducing it to a slurry of its consistent minerals. Upstairs, the occupant's own mineral content was being scavenged from her corpse and sequestered in the foundation unit for later exploitation. The intruder waited as long as she dared to see some of the foam touch the pistol and to witness the violent chemical reaction it touched off. She turned her back on the fizzing, fracturing iron and headed for the vestibule.

The house was entirely blind now and could only hear the intruder, splashing through its rendered fats, moving through the hollows left by its drained marrow with all speed toward its slack mouth.

The intruder tossed the knife she'd used to kill the house on the vestibule floor. It began to smoke and pucker as the house's liquids washed over it. The intruder did not slow down, because she could feel the soles of her shoes becoming soft and tacky. They'd been coated in materials resistant to home teardowns, but the environment was intense and she'd been dawdling in comparison to the mission's timed test runs.

The house died as the intruder stepped through the front door.

The intruder took note of the orange blooms outside, recognizing them for the silent alert they were intended as. No one else

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seemed to have paid them any attention: the locals were either asleep or shouting and hitting things to make their network connections come back. She figured she had possibly one more minute before the house made itself impossible to ignore. She turned right and walked quickly through the dark, listening to the air. The eDoS was still in effect. There were no drones in flight. She tugged the metamaterial mask off and then peeled off the gloves, stuffing them inside the hood and pushing the whole mass of fabric into a pocket. Everything she was wearing would have to be destroyed, but right now there was no point in prioritizing anything. She was concerned about the shoes tracking muck and corroded detritus down the street, but there was very little she could do about that without discarding the shoes right there in the gutter, which created its own problems.

So she walked on to the end of the street, running her fingers through her hair to try and get rid of the matting that wearing the mask had caused. As she turned the corner, the house filled in its own grave.

The whole structure collapsed down into foam and gel. With a crackle she could hear at the street corner, the ground-floor surface mosaic'd itself. Thousands of tiny metal cubes separated with clacks, turned themselves into wafers, inverted themselves, and slotted themselves down into the foundation unit. Every last drop of moisture from the liquefaction of the house sucked down into the unit's vats. Where the house had stood there was now just a plot, a section of green garden behind a smooth dark square metal surface that glistened under the ambient glows of the night. A space like an extracted tooth in the jawbone of the living street.

She was already around the corner by the time the neighbors emerged from their homes to stare at the deleted house.

Within another minute, she'd made it to the next street, where her ride awaited, her driver sitting within her static car. The car was quite deliberately within the radius of the eDoS. When the network went down, the self-driving car stopped moving. It was the only visible car within a couple of blocks. No one was out on the street here.

Cars had surprisingly little onboard memory. They registered how many people boarded them but didn't retain logs of, for instance, people getting out of them while they were dead in the road due to being offline. There were a great many privacy issues around

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cars and how they reported. This made car software porous enough, in fact, to be cheatable.

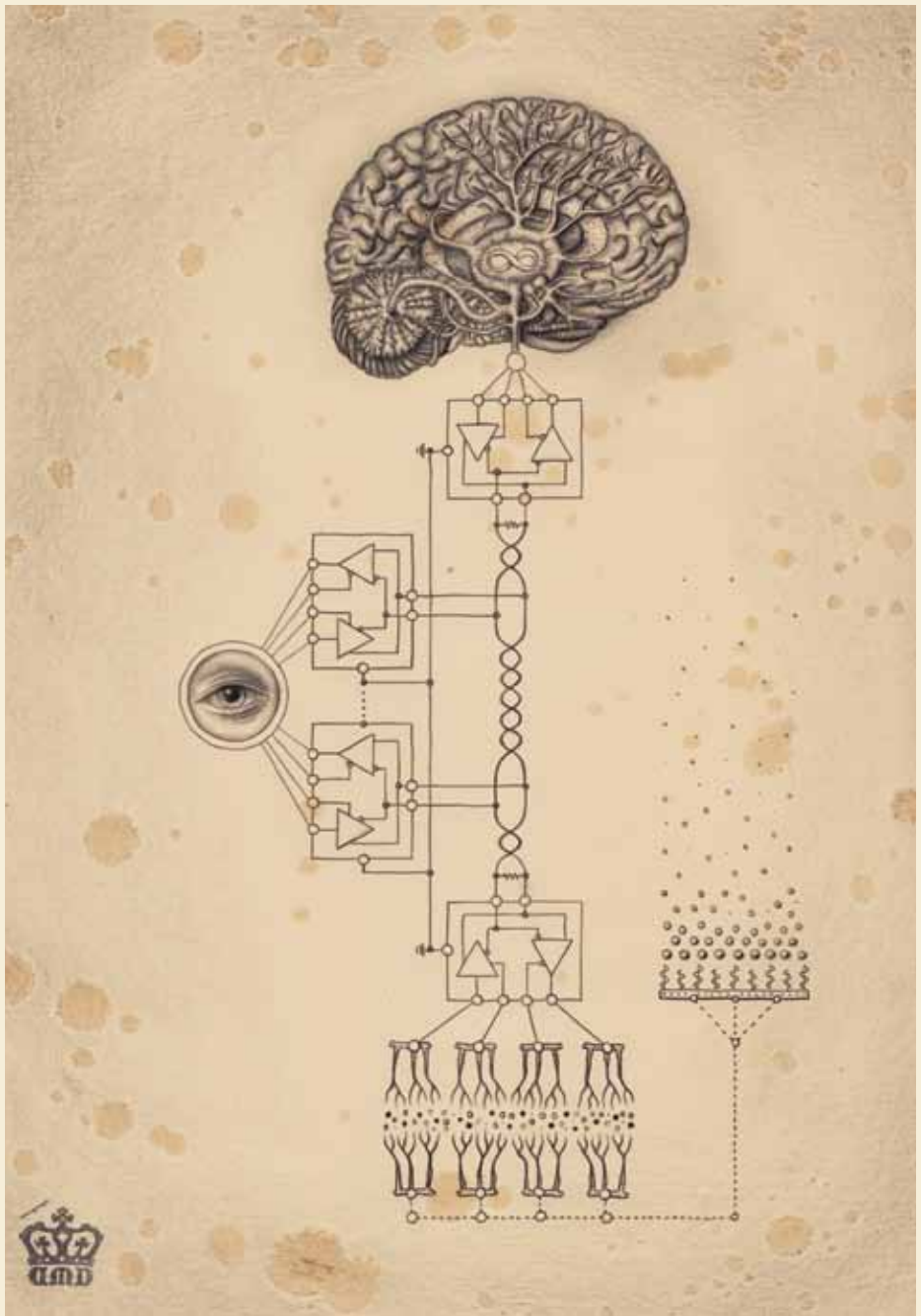
This car had already been told that tonight it had never had a passenger.

The woman who owned the car opened the door, stood, and saw the woman who'd killed the house approach. The intruder was relieved. She smiled, still brushing her hair out. Everything had gone according to plan. Now they'd wait perhaps a minute longer for the eDoS to end, the car would start, and they'd be off to their next staging post for clean-up and debrief.

The driver raised her arm. The intruder waved back. The driver shot her through the heart with a gas-fired ballistic knife. There was nothing of the modern world inside the woman who killed the house, and so she just died right there like the people of old.

The driver tossed the knife handle. It landed in the gutter by a drain and began to foam and fizz. The driver got back into the car. Within thirty seconds or so, the car came back to life and, with a simple canned apology, resumed its transportation of the driver to the next staging post, where it, too, would be murdered.





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*Consciousness System*  
DANIEL MARTIN DIAZ

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# IV. WATER

*BY*  
R a m e z   N a a m

**T**he water whispered to Simon's brain as it passed his lips. It told him of its purity, of mineral levels, of the place it was bottled. The bottle was cool in his hand, chilled perfectly to the temperature his neural implants told it he preferred. Simon closed his eyes and took a long, luxurious swallow, savoring the feel of the liquid passing down his throat, the drops of condensation on his fingers.

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Perfection.

“Are you drinking that?” the woman across from him asked. “Or making love to it?”

Simon opened his eyes, smiled, and put the bottle back down on the table. “You should try some,” he told her.

Stephanie shook her head, her auburn curls swaying as she did. “I try not to drink anything with an IQ over 200.”

Simon laughed at that.

They were at a table at a little outdoor café at Washington Square Park. A dozen yards away, children splashed noisily in the fountain, shouting and jumping in the cold spray in the hot midday sun. Simon hadn’t seen Stephanie since their last college reunion. She looked as good as ever.

“Besides,” Stephanie went on. “I’m not rich like you. My implants are ad-supported.” She tapped a tanned finger against the side of her head. “It’s hard enough just looking at that bottle, at all of this . . .” —she gestured with her hands at the table, the menu, the café around them—“. . . without getting terminally distracted. One drink out of that bottle and I’d be hooked!”

Simon smiled, spread his hands expansively. “Oh, it’s not as bad as all that.” In his peripheral senses he could feel the bottle’s adverttech working, reaching out to Stephanie’s brain, monitoring her pupillary dilation, the pulse evident in her throat, adapting its pitch in real time, searching for some hook that would get her to drink, to order a bottle for herself. Around them he could feel the menus, the table, the chairs, the café—all chattering, all swapping and bartering and auctioning data, looking for some advantage that might maximize their profits, expand their market shares.

Stephanie raised an eyebrow. “Really? Every time I glance at that bottle I get little flashes of how good it would feel to take a drink, little whole body shivers.” She wrapped her arms around herself now, rubbing her hands over the skin of her tanned shoulders, as if cold in this heat. “And if I did drink it, what then?” Her eyes drilled into Simon’s. “Direct neural pleasure stimulation? A little jolt of dopamine? A little micro-addiction to Pura Vita bottled water?”

Simon tilted his head slightly, put on the smile he used for the cameras, for the reporters. “We only use pathways you accepted as part of your implant’s licensing agreement. And we’re well

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within the FDA's safe limits for . . .”

Stephanie laughed at him then. “Simon, it’s *me!* I know you’re a big marketing exec now, but don’t give me your corporate line, okay?”

Simon smiled ruefully. “Okay. So, sure, of course, we make it absolutely as enticing as the law lets us. That’s what advertising’s for! If your neural implant is ad-supported, we use every function you have enabled. But so what? It’s *water*. It’s not like it’s going to hurt you any.”

Stephanie was nodding now. “Mmm-hmmm. And your other products? VitaBars? Pure-E-Ohs? McVita Burgers?”

Simon spread his hands, palms open. “Hey look, *everybody* does it. If someone doesn’t buy our Pura Vita line, they’re gonna just go buy something from NutriYum or OhSoSweet or OrganiTaste or somebody else. We at least do our best to put some nutrition in there.”

Stephanie shook her head. “Simon, don’t you think there’s something wrong with this? That people let you put ads in their *brains* in order to afford their implants?”

“You don’t have to,” Simon replied.

“I know, I know,” Stephanie answered. “If I paid enough, I could skip the ads, like you do. You don’t even have to experience your own work! But you know most people can’t afford that. And you’ve got to have an implant these days to be competitive. Like they say, wired or fired.”

Simon frowned inwardly. He’d come to lunch hoping for foreplay, not debate club. Nothing had changed since college. Time to redirect this.

“Look,” he said. “I just do my job the best I can, okay? Come on, let’s order something. I’m starving.”

Simon pulled up his menu to cut off this line of conversation. He moved just fast enough that for a split second he saw the listed entrees still morphing, optimizing their order and presentation to maximize the profit potential afforded by the mood his posture and tone of voice indicated.

Then his kill files caught up and filtered out of his senses every item that wasn’t on his diet.

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Simon grimaced. "Looks like I'm having the salad again. Oh joy."

He looked over at Stephanie, and she was still engrossed in the menu, her mind being tugged at by a dozen entrees, each caressing her thoughts with sensations and emotions to entice, each trying to earn that extra dollar.

Simon saw his chance. He activated the ad-buyer interface on his own implant, took out some extremely targeted ads, paid top dollar to be sure he came out on top of the instant auction, and then authorized them against his line of credit. A running tab for the new ad campaign appeared in the corner of his vision, accumulating even as he watched. Simon ignored it.

Stephanie looked up at him a moment later, her lunch chosen. Then he felt his own ads go into effect. Sweet enticements. Subtle reminders of good times had. Sultry undertones. Subtle, just below normal human perception. And all emanating from Simon, beamed straight into Stephanie's mind.

And he saw her expression change just a tiny bit.

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Half an hour later the check came. Simon paid, over Stephanie's objection, then stood. He leaned in close as she stood as well. The adverttech monitors told him she was receptive, excited.

"My place, tonight?" he asked.

Stephanie shook her head, clearly struggling with herself.

Simon mentally cranked up the intensity of his ads another notch further.

"I can make you forget all these distractions," he whispered to her. "I can even turn off your ads, for a night." His own adverttech whispered sweeter things to her brain, more personal, more sensual.

Simon saw Stephanie hesitate, torn. He moved to wrap his arms around her, moved his face toward hers for a kiss.

Stephanie turned her face away abruptly, and his lips brushed her cheek instead. She squeezed him in a sudden, brisk hug, her hands pressing almost roughly into his back.

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“Never,” she said. Then she pushed away from him and was gone.

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Simon stood there, shaking his head, watching as Stephanie walked past the fountain and out of his view.

In the corner of his sight, an impressive tally of what he'd just spent on highly targeted advertising loomed. He blinked it away in annoyance. It was just a number. His line of credit against his Pura Vita stock options would pay for it.

He'd been too subtle, he decided. He should have cranked the ads higher from the very beginning. Well, there were plenty more fish in the sea. Time to get back to the office, anyway.

\* \* \*

Steph walked north, past layers of virtual billboards and interactive fashion ads, past a barrage of interactive emotional landscape ads trying to suck her into buying perfume she didn't need, and farther, until she was sure she was out of Simon's senses.

Then she reached into her mind and flicked off the advertising interfaces in her own implant.

She leaned against a building, let her brain unclench, let the struggle of fighting the adverttech he'd employed against her pass.

That bastard, she thought, fuming. She couldn't believe he'd tried that crap on her. If she'd had any shred of doubt remaining, he'd eliminated it. No. He deserved what was coming.

Steph straightened herself, put out a mental bid for a taxi, rode it to Brooklyn, and stepped up to the door of the rented one-room flat. She knocked—short, short, long, long, short. She heard motion inside the room, then saw an eye press itself to the other side of the ancient peephole.

They knew too well that electronic systems could be compromised.

The door opened a fraction, the chain still on it, and Lisa's face appeared. The short-haired brunette nodded, then unlatched the chain, opened the door fully.

Steph walked into the room, closed the door behind her, saw Lisa tucking the home-printed pistol back into her pocket. She hated

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that thing. They both did. But they'd agreed it was necessary.

"It's done?" Lisa asked.

Steph nodded.

"It's done."

\* \* \*

Simon walked south along Broadway. It was a gorgeous day for a stroll. The sun felt warm on his brow. He was overdressed for the heat in an expensive gray silk jacket and slacks, but the smart lining kept him cool nonetheless. The city was alive with people, alive with data. He watched as throngs moved up and down the street, shopping, chatting, smiling on this lovely day. He partially lowered his neural firewalls and let his implants feed him the whisper of electronic conversations all around him.

Civic systems chattered away. The sidewalk slabs beneath his feet fed a steady stream of counts of passers-by, estimates of weight and height and gender, plots of probabilistic walking paths, data collected for the city planners. Embedded biosensors monitored the trees lining the street, the hydration of their soils, the condition of their limbs. Health monitors watched for runny noses, sneezing, coughing, any signs of an outbreak of disease. New York City's nervous system kept constant vigil, keeping the city healthy, looking for ways to improve it.

The commercial dataflow interested Simon more than the civic. His pricey, top-of-the-line implants let him monitor that traffic as only a few could.

In Tribeca he watched as a woman walked by a storefront. He saw a mannequin size her up, then felt the traffic as it caressed her mind with a mental image of herself clothed in a new summer dress, looking ten years younger and twenty pounds lighter. Beneath the physical the mannequin layered an emotional tone in the advert: feelings of vigor, joy, carefree delight. Simon nodded to himself. A nice piece of work, that. He took note of the brand for later study. The woman turned and entered the shop.

He felt other adverttech reaching out all around him to the networked brains of the crowd. Full sensory teasers for beach vacations from a travel shop, a hint of the taste of chocolate from a candy store, the sight and feel of a taut, rippling body from a sports nutrition store. He passed by a bodega, its façade

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open to the warm air, and came close enough that the individual bottles of soda and juice and beer and water reached out to him, each trying a pitch tailored to his height and weight and age and ethnicity and style of dress.

Simon felt the familiar ping of one of the many Pura Vita water pitches and smiled. Not bad. But he had a few ideas for improvements. None of it really touched him, in any case. His implants weren't ad-sponsored. He felt this ad chatter only because he chose to, and even now it was buffered, filtered, just a pale echo of what most of the implanted were subjected to. No. Simon tuned into this ambient froth of neural data as research. He sampled it, observed it from afar, because he must. His success in marketing depended on it.

He was almost to his own building when he passed the headquarters of Nexus Corp, the makers of the neural implant in his brain and millions more. Stephanie didn't understand. This was the real behemoth. So long as Nexus Corp maintained their patents on the neural implant technology, they held a monopoly. The ad-based model, all that most people could afford, was their invention. Simon was just one of thousands of marketers to make use of it to boost demand for their products.

And hell, if people didn't like it, they didn't have to get an implant! It was just the way the world worked. Want to be smarter? Want a photographic memory? Want to learn a new language or a new instrument or how to code overnight? Want all those immersive entertainment options? Want that direct connection with your loved ones? But don't have the cash?

Then accept the ads, boyo. And once you do, stop complaining.

Not that Simon wanted the ads himself, mind you. No, it was worth the high price to keep the top-of-the-line, ad-free version running in his brain, to get all the advantages of direct neural enhancement without the distraction of pervasive multisensory advertising. And, of course, to be able to monitor the traffic around him, to better understand how to optimize his own pitches.

Simon reached his building at last. The lobby doors sensed him coming and whisked themselves open. Walking by the snack bar in the lobby, he felt the drinks and packaged junk food reaching out to him. His own Pura Vita water, of course. And NutriYum water. Simon gave their top competitor's products the evil eye. Someday Pura Vita would own this whole building, and then he'd

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personally see to it that not a single bottle of NutriYum remained.

The lobby floor tiles whispered ahead to the inner security doors, which in turn alerted the elevators. Simon strode forward confidently, layers of doors opening for him of their own accord, one by one, perfectly in time with his stride. He stepped into the waiting elevator and it began to ascend immediately, bound for his level. The lift opened again moments later and he strode to his windowed office. Smart routing kept subordinates out of his path. The glass door to his magnificent office swung open for him. A bottle of cold Pura Vita was on his desk, just how he liked it.

Simon settled into his ready-and-waiting chair, kicked his feet up on the table, and reached through his implant to the embedded computing systems of his office. Data streamed into his mind. Market reports. Sales figures. Ad performance metrics. He closed his eyes and lost himself in it. This was the way to work.

On the back of his jacket, a tiny device, smaller than a grain of sand, woke up and got to work as well.

\* \* \*

Lisa started intently at Steph. "He didn't notice?"

Steph shook her head. "Not a clue."

"And you still want to go through with it?" Lisa asked.

"More than ever."

Lisa looked at her. "The ones who're paying us—they're just as bad as he is, you know. And they're going to profit."

Steph nodded. "For now they will," she replied. "In the long run—they're just paying us to take the whole damn system down."

Lisa nodded. "Okay, then."

She strode over to the ancient terminal on the single desk in the flat and entered a series of keypresses.

Phase 1 began.

\* \* \*

Around the world, three dozen different accounts stuffed with

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crypto-currency logged on to anonymous, cryptographically secured stock market exchanges. One by one, they began selling short on Pura Vita stock, selling shares they did not own, on the bet that they could snap those same shares up at a far lower price in the very near future.

In data centers around the world, AI traders took note of the short sales within microseconds. They turned their analytical prowess to news and financial reports on Pura Vita, on its competitors, on the packaged snack and beverage industries in general. The computational equivalent of whole human lifetimes was burned in milliseconds analyzing all available information. Finding nothing, the AI traders flagged Pura Vita stock for closer tracking.

\* \* \*

“Now we’re committed,” Lisa said.

Steph nodded. “Now let’s get out of here, before Phase 2 starts.”

Lisa nodded and closed the terminal. Five minutes later they were checked out of their hotel and on their way to the airport.

\* \* \*

In a windowed office above the financial heart of Manhattan, a tiny AI woke and took stock of its surroundings.

Location—check.

Encrypted network traffic—check.

Human present—check.

Key . . .

Deep within itself, the AI found the key. Something stolen from this corporation, perhaps. An access key that would open its cryptographic security. But one with additional safeguards attached. A key that could only be used from within the secure headquarters of the corporation. And only by one of the humans approved to possess such a key. Triply redundant security. Quite wise.

Except that now the infiltration AI was here, in this secure headquarters, carried in by one of those approved humans.

Slowly, carefully, the infiltration AI crawled its tiny body up the

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back of the silk suit it was on, toward its collar, as close as it could come to the human's brain without touching skin and potentially revealing itself. When it could go no farther, it reached out, fit its key into the cryptographic locks of the corporation around it, and inserted itself into the inner systems of Pura Vita enterprises, and through them, into the onboard processors of nearly a billion Pura Vita products on shelves around the world.

\* \* \*

In a warehouse outside Tulsa, a bottle of Pura Vita water suddenly labels itself as **RECALLED**. Its onboard processor broadcasts the state to all nearby. Within milliseconds, the other bottles in the same case, then the rest of the pallet, then all the pallets of Pura Vita water in the warehouse register as **RECALLED**. The warehouse inventory management **AI** issues a notice of return to Pura Vita, Inc.

In a restaurant in Palo Alto, Marie Evans soaks up the sun, then reaches out to touch her bottle of Pura Vita. She likes to savor this moment, to force herself to wait, to make the pleasure of that first swallow all the more intense. Then, abruptly, the bottle loses its magic. It feels dull and drab, inert in her hand. An instant later the bottle's label flashes red—**RECALL**. The woman frowns. "Waiter!"

In a convenience store in Naperville, the bottles of Pura Vita on the store shelves suddenly announce that they are in **RECALL**, setting off a flurry of electronic activity. The store inventory management **AI** notices the change and thinks to replace the bottles with more recently arrived stock in the storeroom. Searching, it finds that the stock in the back room has been recalled as well. It places an order for resupply to the local distribution center, only to receive a nearly instant reply that Pura Vita water is currently out of stock, with no resupply date specified. Confused, the inventory management **AI** passes along this information to the convenience store's business management **AI**, requesting instructions.

Meanwhile, on the shelves immediately surrounding the recalled bottles of Pura Vita, other bottled products take note. Bottles of NutriYum, OhSoSweet, OrganiTaste, and BetterYou, constantly monitoring their peers and rivals, observe the sudden recall of all Pura Vita water. They virtually salivate at the new opportunity created by the temporary hole in the local market landscape. Within a few millionths of a second, they are adapting their

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marketing pitches, simulating tens of thousands of scenarios in which buyers encounter the unavailable Pura Vita, angling for ways to appeal to this newly available market. Labels on bottles morph, new sub-brands appear on the shelves as experiments, new neural ads ready themselves for testing on the next wave of shoppers.

In parallel, the rival bottles of water reach out to their parent corporate AIs with maximal urgency. Pura Vita bottles temporarily removed from battleground! Taking tactical initiative to seize local market opportunity! Send further instructions/best practices to maximize profit-making potential!

For there is nothing a modern bottle of water wants more than to maximize its profit-making potential.

At the headquarters of OhSoSweet and OrganiTaste and BetterYou, AIs receive the flood of data from bottles across the globe. The breadth of the calamity to befall Pura Vita becomes clear within milliseconds. Questions remain: What has caused the recall? A product problem? A contaminant? A terrorist attack? A glitch in the software?

What is the risk to their own business?

Possible scenarios are modeled, run, evaluated for optimal courses of action robust against the unknowns in the situation.

In parallel, the corporate AIs model the responses of their competitors. They simulate each other's responses. What will NutriYum do? OhSoSweet? OrganiTaste? BetterYou? Each tries to outthink the rest in a game of market chess.

One by one, their recursive models converge on their various courses of action and come to that final, most dreaded set of questions, which every good corporate AI must ask itself a billion times a day. How much of this must be approved by the humans? How can the AI get the human-reserved decisions made quickly and in favor of the mathematically optimal course for the corporation that its machine intelligence has already decided upon?

Nothing vexes an AI so much as needing approval for its plans from slow, clumsy, irrational bags of meat.

\* \* \*

Johnny Ray walked down the refrigerated aisle, still sweaty from

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his run. Something cold sounded good right now. He came upon the cooler with the drinks, reached for a Pura Vita, and saw that the label was pulsing red. Huh? Recalled?

Then the adverttech hit him.

“If you liked Pura Vita, you’ll love Nutra Vita from NutriYum!”

“OrganiVita is the one for you!”

“Pura Sweet, from OhSoSweet!”

Images and sensations bombarded him. A cold, refreshing mountain stream crashed onto the rocks to his left, splashing him with its cool spray. A gaggle of bronzed girls in bikinis frolicked on a beach to his right, beckoning him with crooked fingers and enticing smiles. A rugged, shirtless, six-packed version of himself nodded approvingly from the bottom shelf, promising the body that Johnny Ray could have. An overwhelmingly delicious citrus taste drew him to the top.

Johnny Ray’s mouth opened in a daze. His eyes grew glassy. His hands slid the door to the drinks fridge open, reached inside, came out with some bottle, the rest of him not even aware the decision had been made.

Johnny Ray looked down at the bottle in his hand. Nutri Vita. He’d never even heard of this stuff before. His mouth felt dry, hungry for the cold drink. The sweat beaded on his brow. Wow. He couldn’t wait to try this.

\* \* \*

While the corporate AIs of the other brands dithered, wasting whole precious seconds, debating how to persuade the inefficient bottleneck of humans above them, the controlling intelligence of NutriYum launched itself into a long prepared course of action.

NutriYumAI logged on to an anonymous investor intelligence auction site, offering a piece of exclusive, unreleased data to the highest bidder.

**30 SECOND ADVANTAGE AVAILABLE—MARKET OPPORTUNITY TO SELL FORTUNE 1000 STOCK IN ADVANCE OF CRASH. GREATER THAN 10% RETURN GUARANTEED BY BOND. AUCTION CLOSES IN 250 MILLISECONDS. RESERVE BID \$100 MILLION. CRYPTO CURRENCY ONLY.**

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Within a quarter of a second it had 438 bids. It accepted the highest, at \$187 million, with an attached cryptographically sealed and anonymized contract that promised full refund of the purchase price should the investment data fail to provide at least an equivalent profit.

In parallel, NutriYumAI sent out a flurry of offer-contracts to retailers throughout North America and select markets in Europe, Asia, and Latin America.

**ADDITIONAL NUTRIYUM WATER STOCK AVAILABLE IN YOUR AREA. 10 CASES FREE, DELIVERY WITHIN 1 HOUR, PLUS 40% DISCOUNT ON NEXT 1000 CASES—EXCHANGE FOR 75% ALLOCATION OF PURA VITA SHELF SPACE AND NEURAL BANDWIDTH ALLOCATION. REPLY WITH CRYPTOGRAPHIC SIGNATURE TO ACCEPT.**

Within seconds, the first acceptances began to arrive. Retailers signed over the shelf space and neural bandwidth that Pura Vita had once occupied in their stores over to NutriYum, in exchange for a discount on the coming cases.

By the end of the day, NutriYum would see its market share nearly double. A coup. A rout. The sort of market battlefield victory that songs are sung of in the executive suites.

\* \* \*

The AI-traded fund called Vanguard Algo 5093 opened the data package it had bought for \$187 million. It took nanoseconds to process the data. This was indeed an interesting market opportunity. Being the cautious sort, Vanguard Algo 5093 sought validation. At a random sample of a few thousand locations, it hired access to wearable lenses, to the anonymized data streams coming out of the eyes and brains of NexusCorp customers, to tiny, insect-sized airborne drones. Only a small minority of the locations it tried had a set of eyes available within the one-second threshold it set, but those were sufficient. In every single location, the Pura Vita labels in view were red. Red for recall.

Vanguard Algo 5093 leapt into action. **SELL SHORT! SELL SHORT!**

It alerted its sibling Vanguard algorithms to the opportunity, earning a commission on their profits. It sent the required notifications to the few remaining human traders at the company as well, though it

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knew that they would respond far too slowly to make a difference.

Within milliseconds, Pura Vita stock was plunging, as tens of billions in Vanguard Algo assets bet against it. In the next few milliseconds, other AI traders around the world took note of the movement of the stock. Many of them, primed by the day's earlier short sale, joined in now, pushing Pura Vita stock even lower.

Thirty-two seconds after it had purchased this advance data, Vanguard Algo 5093 saw the first reports on Pura Vita's inventory problem hit the wire. By then, \$187 million in market intelligence had already netted it more than a billion in profits, with more on the way as Pura Vita dipped even lower.

\* \* \*

Simon's first warning was the stock ticker. Like so many other millionaires made of not-yet-vested stock options, he kept a ticker of his company's stock permanently in view in his mind. On any given day it might flicker a bit, up or down by a few tenths of a percent. More up than down for the last year, to be sure. Still, on a volatile day, one could see a swing in either direction of as much as 2 percent. Nothing to be too worried about.

He was immersing himself in data from a Tribeca clothing store—the one he'd seen with the lovely adverttech today—when he noticed that the ticker in the corner of his mind's eye was red. Bright red. Pulsating red.

His attention flicked to it.

-11.4%

What?

It plunged even as he watched.

-12.6%

-13.3%

-15.1%

What the hell? He mentally zoomed in on the ticker to get the news. The headline struck him like a blow.

**PURA VITA BOTTLES EXPIRING IN MILLIONS OF**

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**LOCATIONS.**

No. This didn't make any sense. He called up the sales and marketing AI on his terminal.

Nothing.

Huh?

He tried again.

Nothing.

The AI was down.

He tried the inventory management AI next.

Nothing.

Again.

Nothing.

Simon was sweating now. He could feel the hum as the smart lining of his suit started running its compressors, struggling to cool him off. But it wasn't fast enough. Sweat beaded on his brow, on his upper lip. There was a knot in his stomach.

He pulled up voice, clicked to connect to IT. Oh thank god.

Then routed to voicemail.

Oh no. Oh please no.

-28.7%

-30.2%

-31.1%

-33.9%

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It was evening before IT called back. They'd managed to reboot the AIs. A worm had taken them out somehow, had spread new code to all the Pura Vita bottles through the market intelligence update channel. And then it had disabled the remote update feature

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on the bottles. To fix those units, they needed to reach each one, *physically*. Almost a *billion* bottles. That would take whole days!

It was a disaster. And there was worse.

NutriYum had sealed up the market, had closed six-month deals with tens of thousands of retailers. Their channel was gone, eviscerated.

And with it Simon's life.

The credit notice came soon after. His options were worthless now. His most important asset was gone. And with it so was the line of credit he'd been using to finance his life.

[NOTICE OF CREDIT DOWNGRADE]

The message flashed across his mind. Not just any downgrade. Down to zero. Down into the red. Junk status.

The other calls came within seconds of his credit downgrade. Everything he had—his midtown penthouse apartment, his vacation place in the Bahamas, his fractional jet share—they were all backed by that line of credit. He'd been living well beyond his means. And now the cards came tumbling down.

[NexusCorp alert: Hello, valued customer! We have detected a problem with your account. We are temporarily downgrading your neural implant service to the free, ad-sponsored version. You can correct this at any time by submitting payment here.]

Simon clutched his head in horror. This couldn't be happening. It couldn't.

Numbly, he stumbled out of his office and down the corridor. Lurid product adverts swam at him from the open door to the break room. He pushed past them. He had to get home somehow, get to his apartment, do . . . something.

He half collapsed into the elevator, fought to keep himself from hyperventilating as it dropped to the lobby floor. Adverts from the lobby restaurants flashed at him from the wall panel as they dropped, inundating him with juicy steak flavor, glorious red wine aroma, the laughter and bonhomie of friends he didn't have. The ads he habitually blocked out reached him raw and unfiltered now, with an intensity he wasn't accustomed to in his exclusive, ad-free life. He crawled back as far as he could into the corner of

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the lift, whimpering, struggling to escape the barrage. The doors opened, and he bolted forward, into the lobby and the crowd, heading out, out into the city.

The snack bar caught him first. It reached right into him, with its scents and flavors and the incredible joy a bite of a YumDog would bring him. He stumbled toward the snack bar unthinkingly. His mouth was dry, parched, a desert. He was so hot in this suit, sweating, burning up, even as the suit's pumps ran faster and faster to cool him down.

Water. He needed water.

He blinked to clear his vision, searching, searching for a refreshing Pura Vita.

All he saw was NutriYum. He stared at the bottles, the shelves upon shelves of them. And the NutriYum stared back into him. It saw his thirst. It saw the desert of his mouth, the parched landscape of his throat, and it whispered to him of sweet relief, of an endless cool stream to quench that thirst.

Simon stumbled forward another step. His fingers closed around a bottle of cold, perfect, NutriYum. Beads of condensation broke refreshingly against his fingers.

*Drink me, the bottle whispered to him. And I'll make all your cares go away.*

The dry earth of his throat threatened to crack. His sinuses were a ruin of flame. He shouldn't do this. He couldn't do this.

Simon brought his other hand to the bottle, twisted off the cap, and tipped it back, letting the sweet cold water quench the horrid cracking heat within him.

Pure bliss washed through him, bliss like he'd never known. This was nectar. This was perfection.

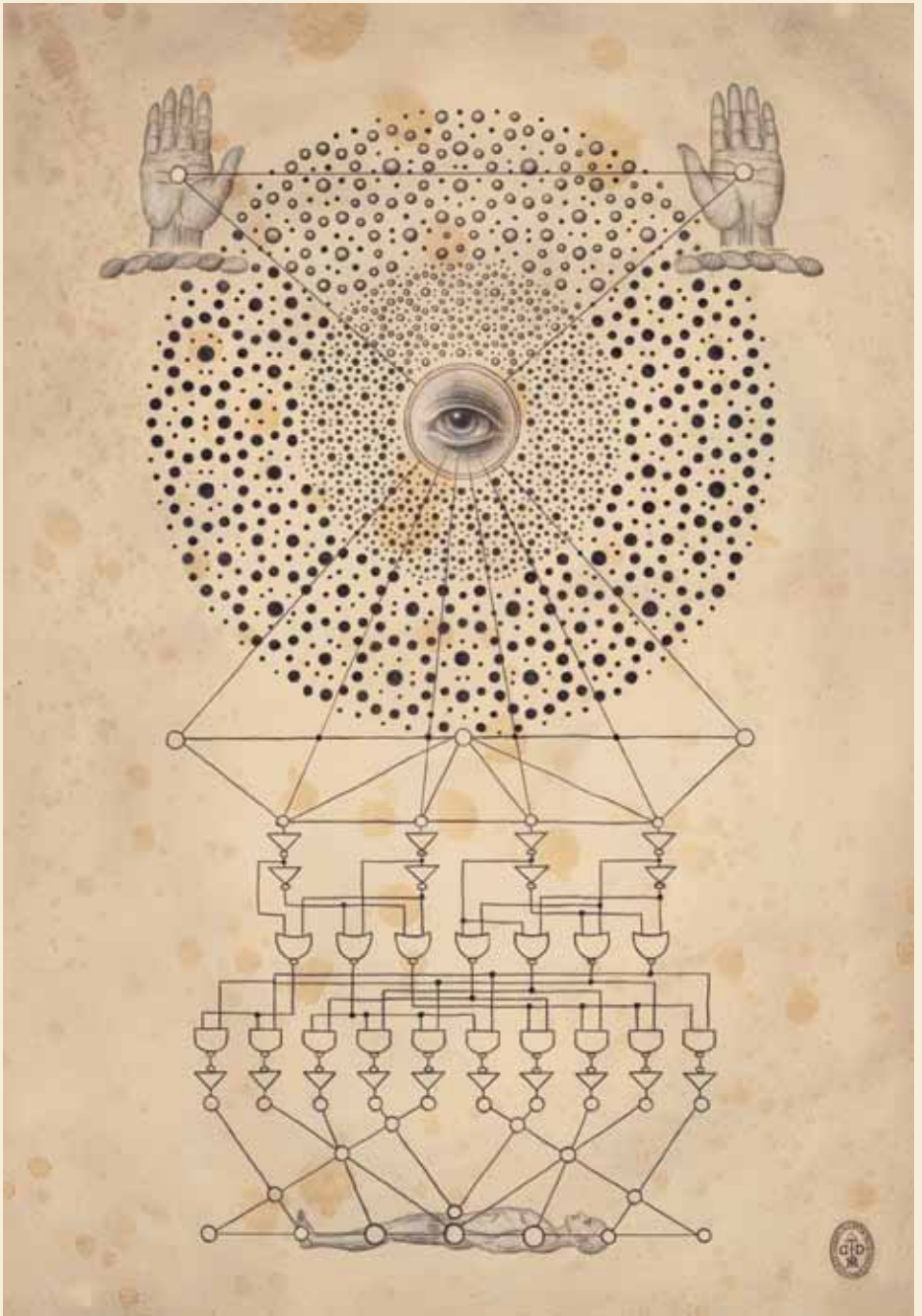
Some small part of Simon's brain told him that it was all a trick. Direct neural stimulation. Dopamine release. Pleasure center activation. Reinforcement conditioning.

And he knew this. But the rest of him didn't care.

Simon was a NutriYum man now. And always would be.

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*Spirit Machine*

DANIEL MARTIN DIAZ

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V.  
SOCIAL SERVICES

BY *madeline* ASHBY

“But I want *my own* office,”  
Lena said. “*My own* space to  
work from.”

Social Services paused for a while to think. Lena knew that it was thinking, because the woman in the magic mirror kept animating her eyes this way and that behind cat-eye horn-rims. She did so in perfect meter, making her look like one of those old clocks where the cat wagged its tail and looked to and

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fro, to and fro, all day and all night, forever and ever. Lena had only ever seen those clocks in media, so she had no idea if they really ticked. But she imagined they ticked terribly. The real function of clocks, it seemed to her, was not to tell time but to mark its passage. *Ticktickticktick. Byebyebyebye.*

"I'm sorry, Lena, but your primary value to this organization lies in your location," Mrs. Dudley said. Lena had picked out her name when Social Services hired her. The name was Mrs. Dudley, after the teacher who rolled her eyes when Lena mispronounced "organism" as "orgasm" in fifth-grade health class. She'd made Social Services look like her, from the horn-rims to the puffy eyes to the shimmery coral lipstick melting into the wrinkles rivening her mouth. Now Mrs. Dudley was at her beck and call all the time and had to answer all the most inane questions, like what the weather was and if something looked infected or not.

"This organization has to remain nimble," Mrs. Dudley said. "We need people ready to work at the grassroots level. You're one of them. Aren't you?"

Now it was Lena's turn to think. She examined the bathroom. It had the best mirror, so it was where she did most of her communication with Social Services. The bathroom itself was tiny. Most of the time it was dirty. This had nothing to do with Lena and everything to do with her niece's baby, whose diapers currently clogged the wastebasket. There was supposed to be a special hamper just for them with a charcoal filter on it and an alert telling her niece when to empty it, but her niece didn't give a shit—literally. Lena had told her that ignoring the alert was a good way to get the company who made the hamper to ping Social Services—a lack of basic cleanliness was an easy way to signal neglect—but her niece just smiled and said: "That's why we have you around. To fix stuff like that."

"That is why you decided to come work for us, isn't it?" Mrs. Dudley asked.

Lena nodded her head a little too vigorously. "Yes," she said. "Yes, that's it exactly."

She had no idea what Social Services had just asked. Probably something about her commitment to her community or her empathy for others. Lena smiled her warm smile. It was one of a few she had catalogued especially for the purposes of work. She wore it to work like she wore her good leather gloves and her

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pretty pendant knife. Work outfit, work smile, work feelings. She reminded herself to look again for her gloves. They didn't have a sensor, so she had no idea how to find them.

"Here is your list for today," Mrs. Dudley said. The mirror showed her a list of addresses and tags. Not full case files, just tags and summaries compiled from the case files. Names, dates, bruises. Missed school, missed meals, missed court dates. "The car will be ready soon."

"Car?"

"The last appointment is quite far away." The appointment hove into view in the mirror. It showed a massive old McMansion in the suburbs. "Transit reviews claim that the way in is . . . unreliable," Mrs. Dudley said. "So we are sending you transport."

Lena watched her features start to manifest her doubts, but she reined them in before they could express much more. "But I . . ."

"The car drives itself, Lena. And you get it for the whole day. I'm sure that allays any of your possible anxieties, doesn't it?"

"Well, yes . . ."

"Good. The car has a Euler path all set up, so just go where it takes you and you'll be fine."

"Okay."

"And please do keep your chin up."

"Excuse me?"

"Your chin. Keep it up. When your chin is down, we can't see as well. You're our eyes and ears, Lena. Remember that."

She nodded. "I—"

A fist on the bathroom door interrupted her. Just like that, Mrs. Dudley vanished. That was Social Services security at work; the interface, such as it was, did not want to share information with anyone else in a space and so only recognized Lena's face. Her brother had tried to show it a picture of her, and then some video, but Lena had a special face that she made to log in, and the mirror politely told her brother to please leave.

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*“Open up!”*

Lena opened the door. Her niece stood on the other side. She handed Lena the baby and beelined for the toilet. Yanking her pants down, she said: “Have *you* ever had to hold it in after an episiotomy?”

“No—”

“Well, you *might* someday, if you ever got a boyfriend, which you shouldn’t, because they’re fucking crap.” The sound of her pissing echoed in the small room. “Someday I’m going to kill this fucking toilet.” She reached behind herself, awkwardly, and slapped it. Her rings made scratching noises on its plastic side. “You were supposed to tell me I was knocked up.”

Lena thought it was probably a bad time to tell her niece that her father, Lena’s brother, was the one responsible for upgrading the toilet’s firmware, and that he had instead chosen to attempt circumventing it so it would give them all its available features (temperature taking, diagnosis, warming, and so on) for no cost whatsoever. He didn’t want the manufacturer knowing how much he used the bidet function, he said one night over dinner. That shit was private.

Her niece didn’t bother washing her hands. She took the baby from Lena’s arms and kissed it absently. “It’s creepy to hear you talking to someone who isn’t there,” she said. Her eyes widened. Her eyeliner was a vivid pink today, with extra sparkles. Her makeup was always annoyingly perfect. She probably could have sold the motions of her hands to a robotics firm somewhere. “Don’t you worry sometimes that you’re, like . . . making it all up?”

Lena frowned. It wasn’t like her niece to consider the existential. “Do you mean making it up as I go? Like life?”

“No no no no no. I mean, like, you’re making up your job.” She glanced quickly at the mirror, as though she feared it might be watching her. “Like maybe there’s nobody in there at all.”

Lena instantly allowed all of her professional affect to fall away, like cobwebs from an opened door. She turned her head to the old grey leather couch with its pillows and blankets neatly stacked, right where she’d left them that morning. She let her niece carry the full weight of her gaze. “Then where would the rent money come from?” she asked.

Her niece had the grace to look embarrassed. She hugged her

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baby a little tighter. "Sorry. It was just a joke." She blinked. "You know? Jokes?"

A little car rolled across Lena's field of vision. Its logo beeped at her. "My car is here," she said. "Try to leave some dinner for me."

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"Is it true they make you all get the same haircut so they can hear better?"

Lena peered over the edges of her frames. Social Services didn't like it when she did that, but it was occasionally necessary. Jude, the adolescent standing before her, seemed genuinely curious and not sarcastic. That didn't make his question any less stupid.

"No," she said. "They don't make us wear a special haircut."

Jude shrugged. "You all just look like you've got the same haircut."

"Maybe you're just remembering the other times I've been here."

Jude smiled dopily around the straw hanging out of his mouth and slurped from the pouch attached to it. It likely contained makgeolli; that was the 22nd floor specialty. Her glasses told her he was mildly intoxicated; he wore a lab-on-a-chip under the skin of his left shoulder, in a spot that was notoriously difficult to scratch. The Spot was different for every user; triangulating it meant a gestural camera taking a full-body picture or extrapolating from an extant gaming profile. "Oh, yeah . . . Yeah, that's probably it."

"Why do you think I'm here, Jude?"

"Because the Fosters aren't."

The kid didn't miss a beat. The algorithm had first introduced them three years ago, when his foster parents took him in; he referred to them privately as "the Fosters." Three years in, "the Fosters" had given up. They collected their stipend just fine, but they left it to Lena to actually deal with Jude's problems.

His main problem these days was truancy; in a year he wouldn't have to go to school any longer unless he wanted to, and so he was experiencing an acute case of senioritis in his freshman year. If he chose to go on, though, it would score Lena some much-needed points on her own profile. There was little difference,

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really, between his marks and her own.

“Is there any particular reason you’re not going to school these days?”

Jude shrugged and slurped on the pouch until it crinkled up and bubbled. He tossed the empty into the sink and leaned over to open the refrigerator. You didn’t have to really move your feet in these rabbit hutch kitchens. He got another of the pouches out. “I just don’t feel like it,” he said.

“I didn’t really much feel like going, either, when it was my turn, but I went.”

Jude favoured her with a look that told her she had best shut her fucking mouth right fucking now. “School was different for you,” he said simply. “You didn’t have to wear a uniform.”

“Well, that’s true—”

“And your uniform didn’t ping your teacher every time you got a fucking boner.”

Lena blushed and then felt herself blushing, which only made it worse. She looked down. True, their school district was a little too keen on wearables, but Jude’s were special. “You know why you have to wear those pants,” she said.

“That was when I was thirteen!”

“Well, she was ten.”

“I know she was ten. I fucking know that. There’s no way I could possibly forget that, now.” He crossed his arms and sighed deeply. “We didn’t even do anything.”

“That’s not what you told your friends on 18.”

He sucked his teeth. Lena had no idea if Jude had really done the things he said he did. The lab inside the little girl had logged enough dopamine to believe sexual activity had occurred, but it had no way of knowing if she’d helped herself along or if she’d had outside interference. The rape kit had the same opinion: penetration, not forced entry. When the relationship was discovered, the girl recanted everything and said that nothing had happened, and that it didn’t matter anyway because even if something had happened, she really loved Jude. Jude did the

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same. Except he never said he loved her. This was probably the most honesty he had demonstrated during the entire episode.

"I know it's difficult," Lena said. "But completing your minimum course credits is part of your sentencing. It's part of why you get your record expunged when you turn eighteen. So you have to go." She reached into the sink and plucked out the pouch with her thumb and forefinger. It dangled there in her grasp, dripping sweet white fluid. "And you have to quit drinking, too."

"I know," he said. "It's stupid. I was just bored, and it was there."

"I understand. But you're hurting your chances of making it out of here. This kind of thing winds up on your transcript, you know. You can't get a job without a decent transcript."

Jude waved his hand. "The fabbers don't care about grades."

"Maybe not, but they care about you being able to show up on time. You know?"

He rolled his eyes. "Yeah. I know."

"So you'll go to school tomorrow?"

"Maybe. I need a new uniform first."

"Excuse me?"

"Well, it's really just the pants. I threw them out."

Lena blinked so that her glasses would listen to her. "Well, we have to find those pants."

The glasses showed her a magnifying glass zipping to and fro across the cramped, dirty apartment. It came back empty. "You really threw them out?" she asked, despite already knowing the answer. Maybe he'd given them to a friend. Or sold them. Maybe they could be brought back, somehow.

"I think they got all sliced up," Jude said, miming the action of scissors with his fingers. "I wore my gym clothes home yesterday, and I put my other stuff in my bag, and then under the viaduct, I gave them to this homeless dude. He found the sensors right away. Said he was gonna sell 'em."

She winced. "How do you know he's not wearing them?"

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“They were too small.”

It was beyond her power. She would have to arrange for a new uniform. She'd probably have to take Jude to school tomorrow, too, just to smooth things over. He tended to start a new attendance streak if someone was actually bringing him there. The record said so, anyway. For a moment it snaked across her vision, undulating and irregular, and then she blinked and it was gone.

“I'll be here tomorrow at seven to take you to school,” she said, and watched the appointment check itself into her schedule. “And don't even think about not being here, or not waking up, or getting your mom to send a note, or anything like that. I intend to show up, and if you don't do the same, Social Services will send someone else next time, and they won't be so understanding. Okay?”

Jude snorted. “Okay.”

“I mean it. You have to show up. And you have to show up sober. I'll know if you're not, and so will your principal. He can suspend you for that, on sight.”

“I know.” Jude paused for a moment. He reached for the fresh pouch, and then seemed to think better of it. “I'm sorry, Lena.”

“I know you're sorry. You can make it up to me by showing up tomorrow.”

“I don't want them to send someone else. I didn't mean to get you in trouble. I was just mad, is all.”

“You would have better impulse control if you quit drinking. You know that, right?”

“Yeah.”

“So you know what we have to do next, right?”

He sighed. “Seriously?”

“Yes, seriously. I can't leave here without it.”

They spent the next half hour cleaning out his stash. He even helped her bring it down to the car. “Are you sure this is it?” he asked, when it perked up at Lena's arrival.

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“It’s on loan,” she said. “Some people lease their vehicles on a daily basis to Social Services, and the car drives itself back to them at the end of the day with a full charge.”

“It’s a piece of shit.”

“Just put the box in the back, will you?”

Jude rolled his eyes as she popped the trunk. Technically, she shouldn’t have allowed him to come down to the garage with her. It wasn’t recommended. Her glasses had warned her about it as they neared the elevator. She made sure Jude carried the box full of pouches and pipes, though, so that he’d have to drop it if he wanted to try anything. Now she watched as he leaned over the trunk and set the box inside.

“Nice gloves.” He reached in and brought something out: Lena’s good leather gloves. They were real leather, not the fake stuff, with soft suede interiors and an elastic skirt that circled the wrist and kept out the cold air. They were a pretty shade of purple. Distinctive. Recognizable. “Aren’t these yours?” he asked.

“I . . . ”

“I’ve seen you wearing them before.” He frowned. “I thought you said this was someone else’s car. On loan.”

“It is . . . ”

“So how did your gloves wind up in the trunk?”

Lena wished she could ask the glasses for help. But without sensors, the glasses and the gloves had no relationship. At least, nothing legitimate and quantifiable. They had only Lena to link them.

“I must have used this car before,” she said. “That must be it. I must have forgotten them in here the last time and not used the trunk until then. And the owner left the gloves in the trunk, hoping that I’d find them.”

“Why the trunk? Why not on the dash? How many times do you look in the trunk?”

Jude slammed the trunk shut. He held the gloves out. Lena took them gingerly between her thumb and forefinger. They felt like her gloves. A little chilled from riding around in the trunk, but

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still hers. How strange to think that they'd gone on their own little adventure without her. Hadn't the car's owner been the least bit tempted to take them? Or one of the other users? There were plenty of other women on the Social Services roster. Maybe they'd been worn out and then put back, just like the car. Maybe the last user was someone higher up on the chain, and they knew Lena would be taking this particular car out on this particular morning, and they put her gloves back where she would find them. That would explain how she'd never seen them until just now.

"Don't look so creeped out," Jude said. "They're just a pair of gloves, right?"

"Right," Lena said. "Thanks."

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By the end of the day, Lena had to admit that the car did not look familiar in the least. That didn't mean it looked *unfamiliar*, either, just that it looked the same as all the other print jobs in the hands-free lane. The same flat mustard yellow, the same thick bumper that made the whole vehicle look like a little man with a mustache. It was entirely possible that she had used this car before. Perhaps even on the same day that she'd lost her gloves. She didn't remember losing them. That was the thing. She kept turning them in her hands, over and over, pulling them on and pulling them off, wiggling her fingers in their tips to feel if they were truly hers or not.

When had she last used a car for Social Services?

"February of last year," Mrs. Dudley said. "February fifteenth, to be exact."

Lena did not remember speaking the words aloud, either. But that hardly mattered. It was Social Services' job to understand problems before they became issues. That was how they'd first found Jude, after all. Surely the glasses had logged her examination of the gloves and the car and the system had put two and two together. It could do that. She was sure of it.

"You subvocalized it," Mrs. Dudley said.

Yes. That was it. People did that sometimes, didn't they? They muttered to themselves. It wasn't at all unusual.

"People do it all the time," Mrs. Dudley told her.

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Lena forced herself to speak the next words out loud. "Did the owner of the car save the gloves for me?"

Mrs. Dudley paused. "That's one way of putting it."

"What do you mean?"

Outside, the highway seemed empty. So few people drove any longer. Once upon a time, four o'clock on a Friday afternoon in late October would have been replete with cars, and the cars would have been stuffed with mothers and fathers lead-footing their way into the suburbs, anxiously counting down the minutes until they earned a late fee at their daycare. Now the car whizzed along, straight and true, spotting its nearest fellow vehicle every ten minutes and pinging them cheerfully before zipping ahead.

It felt like driving into a village afflicted by plague.

"I think we need to bring you in for a memory exam, Lena," Mrs. Dudley said. "These lapses aren't normal for a woman in your demographic. You may have a blood clot."

"Oh," Lena said, perversely delighted by the thought.

"But first, you have to do this one last thing for us."

"Yes. The house in the suburbs."

"You must be very careful, Lena. Where you're going, there's no one else on the block. It's all been foreclosed. And it's going to be dark soon."

"I understand."

"The foreclosures mean that the local security forces have been diminished, too. Their budget is based on population density and property taxes, so there won't be anyone to come for you. Not right away, anyway. Everyone else lives closer to town."

"Except for the people in this house."

Another pause. "Yes. The ones who live there, live alone."

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Jackson Hills was the name of the development. The hills themselves occupied unincorporated county land, the last free sliver

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of property in the whole area, and the crookedness of the rusting street signs seemed meant to tempt government interference. That was an old word for molestation, Lena remembered. You came across it in some of the oldest laws. *Interference*. As though the uncles she spent her days hearing about were nothing more than windmills getting in the way of a good signal.

Was it an uncle that was the trouble this time? The file was very scant. "*Possible neglect*," it read. The child in question wore old, ill-fitting clothes, a teacher said. His grades were starting to slip. His name was Theodore. People called him Teddy. His parents never came to Parent/Teacher Night. They attended no talent shows. But they were participatory parents online; their emails with Teddy's teachers were detailed and thoughtful, with perfect spelling and grammar.

*"We intend to discuss Teddy's infractions with him as soon as possible,"* one read. *"We understand that his hacking the school lunch system to obtain chicken fingers every day for a month is very serious, as well as nutritionally unwise."*

Teddy had indeed hacked the school lunch system to order an excess of chicken fingers delivered to the school kitchen by supply truck. He did this by entering the kitchen while pretending to go on a bathroom break and carefully frying all the smart tags on all the boxes of frozen chicken fingers and fries with an acne zapper. With all the tags dead, the supplier instantly re-upped the entire order. The only truly dangerous part of the hack was the fact that he'd been in the walk-in freezer for a whole five minutes. Surveillance footage showed him ducking in with his coat zipped up all the way. The coat itself said that his body temperature had never dipped.

"I don't get any junk food at home," the boy said during his inevitable talk with the principal. "They don't deliver any."

The gate to Jackson Hills was still functional despite the absence of its residents. It slid open for Lena's car. As it did, a dervish of dead leaves whirled out and scattered away toward freedom. It felt like some sort of prisoner transfer. The exchange made, Lena drove past the gate.

The car drove her through the maze of empty houses as the dash lit up with advertisements for businesses that would probably never open. Burger joints. Day spas. Custom fappers. In-house genome sequencing. All part of "town and country living at its

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finest." Some of the houses looked new; there were even stickers on the windows. As she rolled past, projections fluttered to life and showed laughing children running through sprinklers across the bare sod lawns, and men flipping steaks on grills, and women serving lemonade. It was the same family each time.

"WELCOME HOME," her dashboard read.

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The house stood at the top of the topmost hill in Jackson Hills. Lena recognized it because the map said they were drawing closer, and because it was the only house on the cul-de-sac with any lights on. It was a big place, but not so different from the others, with fake Tudor styling and a sloping lawn whose sharpest incline was broken by terraced rock. Forget-me-nots grew between the stones. Moss sprang up through the seams in the tiled drive. There was no car, so Lena's slid in easily and shut itself off with a little sigh, like a child instantly falling asleep.

At the door, Lena took the time to remove her gloves (when had she put those on?) and adjust her hair. She rang the bell and waited. The lion in the doorknocker twinkled his eyes at her, and the door opened.

Teddy stood there, wearing a flannel pyjama and bathrobe set one size too small for his frame. "Hello, Lena," he said.

She blinked. "Hello, Teddy."

"It's nice to meet you. Please come in."

Inside, the house was dusty. Not dirty or even untidy, but dusty. Dust clung to the ceiling fans. Cobwebs stretched across the top of every shelf and under the span of every pendant light. The corners of each room had become hiding places for dust bunnies. But at Teddy's height, everything was clean.

"Where are your parents, Teddy?"

"Would you like some tea?" Teddy asked. "Earl Grey is your favorite, right?"

Earl Grey was her favorite. As she watched, Teddy padded over to the coffee table in the front room and poured tea from a real china service. It had little pink roses on it, and there was a sugar bowl with a lid and a creamer full of cream and even a tiny dish

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with whisper-thin slices of lemon. When he was finished pouring, Teddy added two sugars and a dash of cream to the cup. He handed her the cup on a saucer with both hands and then pressed something on his watch.

"It tells when it's done steeping," he said. "Would you like to sit down?"

Lena sat. The sofa shifted beneath her, almost as though she'd sat on a very large cat. A moment later it had moulded itself to her shape. "It's smart foam," Teddy said. "Please try some of your tea. I made it myself."

Lena sipped. "You've certainly done your homework, Teddy," she said. "You're not the only person to research me before my arrival, but you're the only one who's ever been this thorough."

"I wanted to make it nice for you."

It was an odd statement, but Lena let it pass. She took another sip. "This is a very lovely house, Teddy. Do you help your parents with the housework?"

He nodded emphatically. "Yes. Yes, I do."

"And are you happy living here?"

"Yes, I am."

"There don't seem to be many other kids to play with," Lena said. "Doesn't it get lonely?"

"I don't really get lonely," he said. "I have friends I play with online."

"But it can't be very safe to live here all alone."

His mouth twitched a little, as though he had just heard the distant sound of a small animal that he very much wanted to hunt. "I'm not alone," he said.

"Well, I meant the neighbours. Or rather, the lack of any."

His shoulders went back to their relaxed position. "I like it here," he said. "I like not having any neighbours. My parents didn't like it very much at first, but I liked it a lot."

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Since he had left the door open, Lena decided to go through it. "So when are your parents coming?"

"They're here," he said. "They just can't come upstairs right now."

Lena frowned. "Are they not well?"

Teddy smiled. For a moment, he actually looked like a real eleven-year-old and not like a man who had shrunk down to size.

"They're busy," he said. "Besides, you're here to talk to me, right?"

"Well . . . Yes, that's true, but . . ." She blinked again, hard. It was tough to string words together for some reason. Maybe Mrs. Dudley was right. Maybe she did need her brain scanned. She felt as though the long drive in had somehow hypnotized her, and Teddy now seemed very far away.

"I hope that we can be friends, Lena," Teddy said. "I liked you the last time they sent you here."

Her mouth struggled to shape the words. "What? What are you talking about?"

"You wore those gloves last time," he said. "In February. You'd had a really lonely Valentine's Day the day before, and you were very sad. So I made you happy for a little while. I had some pills left over."

It was very hot in the room suddenly. "You've drugged me," Lena said.

Teddy beamed. "Gotcha!"

Lena tried to stand up. Her knees gave out and her forehead struck one corner of the coffee table. For a moment she thought the warmth trickling down her face was actually sweat. But it wasn't.

"Uh oh," Teddy said. "I'll get some wipes."

He bounded off for the kitchen. Lena focused on her knees. She could stand up if she just tried. She had her pendant knife. She could . . . what? Slash him? Threaten him? Threaten a child? She grasped the pendant in her hand. Pulled it off its cord. Unflipped the blade.

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When Teddy came back with a cylinder of lemon-scented disinfectant wipes, she pounced. She was awkward and dizzy, but she was bigger than him, and she knocked him over easily. He saw the knife in her hand, gave a little shriek of delight, and bit her arm, hard. Then he shook his little head, like a dog with a chew toy. It hurt enough to make her lose her grip, and he recovered the knife. He held it facing downward, like scissors. He wiped his mouth with the back of his other hand.

"I knew I liked you, Lena," he said. "You're not like the others. You don't really like kids at all, do you? This is just your job. You'd rather be doing something else."

"That's . . ." Her vision wavered. "That's not true . . ."

"Yes, it is. And it's okay, because I don't like other kids, either. They're awful. They're mean and stupid and ugly and poor, and I don't want to see them ever again. I just want to stay home forever."

Lena heard herself laughing. It was a low, slow laugh. She couldn't remember the last time she had heard it.

"Why are you laughing?" Teddy asked.

"Because you're all the same," she said. "None of you want to go to school!" She laughed again. It was higher this time, and she felt the laugh itself begin to scrape the dusty expanse of the vaulted ceiling and the glittering chandelier that hung from it. She could feel the crystals trembling in response to her laughter. She had a pang for Jude, who would have absolutely loved whatever shit Teddy had dosed her with.

"I just need someone to create data," Teddy was saying. "I've tried to keep up the streams by myself, but I can't. There are too many sensors. I have to keep sleeping in their bed. I have to keep riding their bikes. Both of them. Do you even know how hard that is?"

Lena couldn't stop laughing. She lay on the floor now, watching her blood seep down into the fibres of the carpet. It was white, and it would stain badly. Maybe Teddy would want her to clean it up. That seemed to be her lot in life—cleaning up other people's messes. But as she watched, Teddy got down on his knees and began to scrub.

"It won't be that bad," he said. "I'll make it nice for you. All I need

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is someone to pretend to be my mom so I can do homeschool. I have all her chips still. I took them while she was still warm, and I kept them in agar jelly from my chemistry set.” He winced. “I would have gotten Dad’s, too, but he was too fat.”

Teddy reached out his hand. “Do you think you can make it to the dining table?”

She let him help her up. “Social Services . . . ”

“You can quit tomorrow,” Teddy said. “Just tell them you can’t do it anymore.”

“But . . . My mirror . . . ” Why was she entertaining any of this? Why was she helping him?

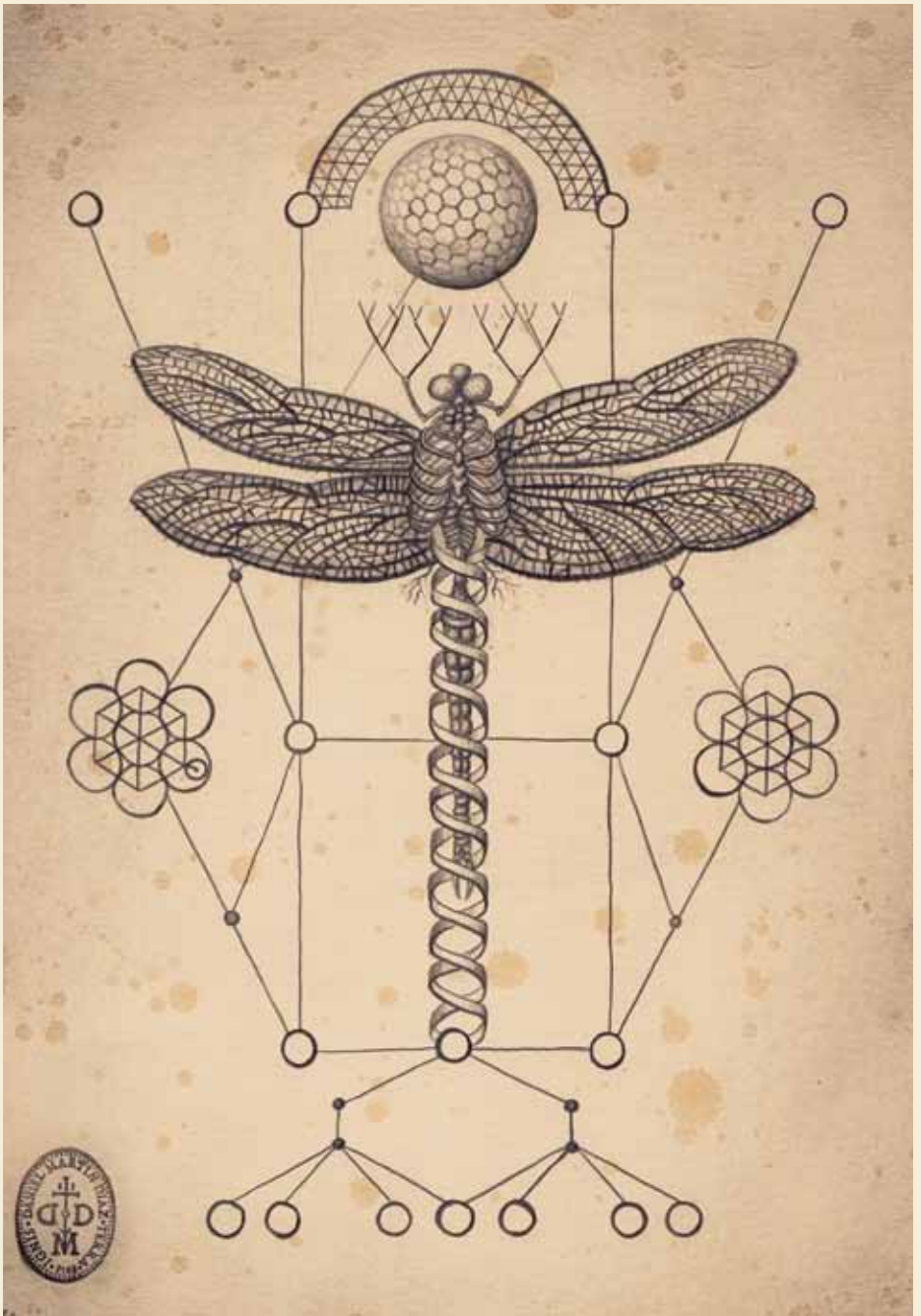
“I have a mirror,” he said. “Your face is the login, right? You talked to my mirror the last time you were here. You just don’t remember because you blacked out later.”

She turned to him. “This is real?”

He smiled and squeezed her cold hand in his much warmer and smaller one. “Yes, Lena. It’s all real. This is a real house with real deliveries and real media and a real live boy in it. It’s not like a haunted house. It was, until you came. But it’s your home now. Your own place, just for you and me.”

“For . . . ”

“Forever. For ever and ever and ever.”



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*Mutation Machine*  
DANIEL MARTIN DIAZ

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VI.

FROM BEYOND  
*the*  
COMING AGE  
*of*  
NETWORKED  
MATTER

BY

*bruce* STERLING

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I wasn't too chuffed about the weird changes I saw in my favorite start-up guy. Crawferd was a techie I knew from my circuit: GE Industrial Internet, IBM Smart Cities, the Internet-of-Things in Hackney hackathons. The kind of guy I thought I understood.

I relied on Crawferd to deliver an out-there networked-matter pitch to my potential investors. He was great at this, since he was imaginative, inventive, fearless, tireless, and he had no formal education. Crawferd wore unlaced Converse shoes and a lot of Armani. He had all the bumbling sincerity of a Twitter Arab Spring.

Crawferd could see no difference between physics and metaphysics. The way he had it figured, all matter was code. If you suggested that his trippy hacker mysticism was not entirely plausible—that rocks were rocks and trees were trees, they weren't "networks"—he'd brood at length, then chase you from the hackerspace, slam the door, and blog compulsively.

Given his deep unworldliness and his intense interior life, Crawferd was a pretty easy guy for me to manage. We got along okay, while Sophia and Fatima totally loved Crawferd. S&F were my two wealthy oil widows from Dubai. Their Gulf State pin money had to go somewhere that wasn't Cyprus or Bitcoins.

So for a while things were cozy. I'd arrange funding brunches in Gstaad, where Fatima and Sophia went skiing. I'd wheel in Mr. California Ideology while they had their mint tea and shared the hookah. The sparks would fly.

Crawferd was cool about Sophia and Fatima. He never asked them for much, and he always brought them nifty digital fitness toys. All tech chicks kind of dug Crawferd. He had this spooky geek tenderness, a possibly sensual, my bits-might-turn-to-atoms thing going on.

So S&F hung on his every word, but the truth was, the guy simply didn't know how to cash in. He was all sci-fi and no megacorp.

Then he missed a couple of gigs and he stopped updating on LinkedIn. I was busy helping Microsoft waste some Kinect money, so I didn't bother him.

Then I breezed through Palo Alto and he spotted me on Foursquare. He shot me a mysterious, incoherent SMS full of sick Tweet orthographics. "W3 sh4ll overl4p time, space, and dimensions,

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and without bodily motion, peer to the uoɹɹæɹɔ ɔo uoɹɹoɹ.”

I got rid of that thing pronto. I always erase after reading, my lawyer taught me that. But seeing his freaked message, I took good care to meet him F2F.

Crawferd was lurking and had gone very downside-scenario. He had tinfoiled all the windows inside a nameless AirBnB, which he'd rented from some shivering TumblrGoth who was way into, like, black candles, inverted pentagrams, and big plastic 3Dprinted gargoyles.

Fancy LED lights in Shapeways Nervous-System lamps were segueing through every color in the spectrum, while Soundcloud was streaming the shriekiest works of Grimes.

This was not his customary scene, and I further perceived that my man Crawferd had shed several kilos, dyed his hair pastel, and failed to shave. He kept compulsively stroking the filthy screen of his Chinese-knockoff fondleslab.

“Buzz, old buddy,” he croaked at me, “it used to upset me, because I couldn't deliver a massive breakthrough in the networked-matter space. I talked a great game sometimes. But I couldn't execute. But now I'm so freaked out! Yes! Freaky from success! I have networked matter!”

Crawferd had this thousand-mile killer-drone stare now, and also that rigid, pedantic, coder tone of voice, that grammar-nazi thing you see mostly on Ayn Rand websites.

My deliverable seemed clear to me: reduce fever, resume chill, and restore functionality.

“Crawferd, pal, listen up. You've been way overdoing it in an overheated tech scene. I've got your back, and I'm thinking Oahu. There's this cool yoga-hula ashram out there, no Internet connectivity, no cell-phone bars, nothing. Some exercise, brown rice, and vitamin B, and you'll be the old Crawferd in no time.”

“Buzz, this matter is about matter. We see matter because we're constructed from matter. We imagine we're made from matter because all we can measure with our network sensors is a narrowly materialistic set of inputs. But that is not the cosmic truth, Buzz. A new science underlies 'matter.' It's about a cellular-automata framework in which all material manifestations are computationally equivalent.”

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I'd seen these sad symptoms in other guys like him. My fave Californian tech boy had gone straight off the ledge into full Erik Davis technosis. "Oahu's just hours away. Beaches, blue sky, maybe a sweet, understanding hippie lady with some pakalolo."

"I have found the grail for the coming age of networked matter, Buzz. I have seized its Philosopher's Stone. I have found a way to transform all matter into network."

"Why?" I said.

He got that look on his face. "What do you mean, 'why'?"

"Where is my user benefit? Where is the business model? You can't get VC backers for that scheme! That is pure Tim Leary mystic woo-woo! You're a coder, Crawferd. I can hear crap like that from L.A. screenwriters."

"Do I look like I'm handwaving at you? I have built a freaking demo! I can run it for you, right here, off my phablet."

Crawferd was a proud and touchy fanatic, but then again, so was Steve Jobs. You can take one fatal step too far into the Reality Distortion Field, and all the typewriters will vanish. They don't come back, either. "So, what does your demo, uh, demo?"

"You remember those two Maker kids? The ones I had hacking those beehives for me?"

I remembered his interns, all right. Two cute Millennial designer kids. Their names escaped me, but she was, like, very Kevin Kelly techno-emergence, while he was very Jussi Parikka insect media. They were Crawferd's start-up slaves. Being Makers, they worked around the clock without a salary, just like bees did.

"Your beehive kids," I said.

"Great design research team! They went deep into the bee 'unwelt,' that sensory world of bees that only bees can perceive. Bees are intensely illustrative of matter-networking principles. Bees scarcely have brains, yet they still assemble and congeal all the nectar and pollen within a given area."

"So that's your demo? It's bees? Cut to the chase! Where's the humming and stinging?"

"That's not my demo yet . . . but here, look what they did on

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Kickstarter. You'll appreciate this."

Crawferd caressed his cruddy little "phablet"—man, I really hate that word—and there they were, Crawferd's two favorite Maker kids. Nicely dressed up in black and yellow bee-themed cosplay duds, with that embedded video that crowdfunding projects always do.

"Hi there, people of the Internet! I'm Adrienne, a graphic interface designer from Rocky Mountain College of Art and Design, and this is Julio, my coder and Significant Other!"

There followed ninety seconds of jerky handheld from Adrienne's iPhone. Her pitch was all about the graphic interfaces through which bees perceive and manipulate matter. Bee sensors, mostly, their compound eyes, antennae, and their big tonguey mandibles.

Then Julio horned in, to vlog about the bee-code running on their tiny bee brains.

Bee brains lacked much processing power. Just enough hardware in there to run a high-level bee-dance language where the bees could clue each other in about tasty matter resources. Adrienne had mocked this system up on a whiteboard with boxes and arrows. Julio had coded it with open-source modules.

Then they'd created these 3Dprinted plastic "bee puppets." Their fake plastic Maker bees were, like, awesomely effective at bee dancing. Their robot bees, set dancing by Arduino, were basically Trojan Bees. They had gotten root in the hive. They had powned the hive colony superorganism. Those bees would do whatever the hackers wanted.

"Their bee-swarm pitch is out of this world!" I told Crawferd. "I can't believe I haven't seen this idea before!"

The Maker kids ramped up to their triumphant climax. Being new to California, they'd noticed all the window-box marijuana plants. They'd hacked their bees to go out to forage for dope pollen.

They showed the camera their existence proof: a double fistful of honey-drenched Silicon Valley hashish.

Then little Adrienne and Julio modestly asked the public for twenty grand to go 3Dprint some beehives, so they could issue some royal-jelly marijuana prescriptions. A business-model

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screwup that was total facepalm. Of course their Kickstarter had exploded. Just gone ballistic. It had blown past twelve million USD in capital and was heading north at high speed.

“You have created a monster,” I told Crawferd. “I can see why you’re so upset now. This is not even funny. Where are those crazy kids? They’re gonna need to lawyer up.”

“They’re no longer with me,” muttered Crawferd. “That’s the bad part. That’s why I’m hiding in here.”

“So where’d they run off to?”

Crawferd toyed guiltily with the hopelessly tangled power cord of his phablet. “It’s worse than that.”

“It’s worse than drugs? They’re busted?”

“Sort of. Worse!”

“They’re kidnapped? Mexican marijuana mob? Paramilitary? Body bags, they’re hanging from an overpass?”

“Lots worse. Totally worse than that. That’s kid stuff compared to what happened.”

“Knock it off with the eldritch, nebulous hints, Crawferd! Put it in words of one syllable!”

“I helped them refine their bee-network code. We discovered an underlying network that holds matter together. That code has very wide applications—and they ran it! They hit the Return key! Next millisecond, and they materially failed to compile. Adrienne and Julio just glitched out. Poof, gone, both of them, gone like New Aesthetic render-ghosts.”

Crawferd mournfully shook his pastel-dyed head. “Something . . . took a bite right out of material reality. Something like an oblate spheroid, some kind of matte-black collapse field. It devoured them, their desktop, the backups, plus two big round scoops out of the wall and ceiling . . . Nothing left of them but their Melissa jelly shoes.”

“Your interns are dead, Crawferd?”

“No, it’s so much worse than just that! I keep telling you! This stuff we call ‘matter’ is just a fraction of what the ‘network’ is

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all about.” Crawferd reached out and clicked off the lamp. The shareable room fell into a deep gloom.

“The true reality is mostly darkness,” he intoned. “There is scarcely any light or matter—that’s just the graphic front end for the cosmic code. Most of the cosmic code is Dark Energy and Dark Matter. The stuff we foolishly call ‘reality’ is the cute friendly part with the kid-colored don’t-be-evil Google graphics. The true, actual, cosmic reality is the giant Google network pipes and the huge steel barns full of Google Cloud. It’s vast and alien and terrifying. Julio and Adrienne rashly pried off the surface of that code. Then the two of them, they just . . . They bluescreened. They snowcrashed. They went Dark.”

Due to some vagary of the network, the video on the Kickstarter had started over again. There were little Adrienne and Julio . . . two YouTube phantoms now, still going through their motions, perky and undaunted.

“It’s not that I can’t believe you, Crawferd,” I said. “I can get my head around your story. I saw what Netflix did to Blockbuster.”

“Unheard-of cosmic forces rendered both of them,” said Crawferd, wiping at his reddened eyes. “My Maker kids are smaller than ultrasonic mist now. They were particle-animated down to Wolfram cellular computrons.”

I couldn’t face the guy in his grief and woe. In fact, I couldn’t tear my eyes from the cheap Chinese phablet with its Kickstarter screen. “Man, they sure had one killer networked-matter application. Look, they’ve raised fifty grand more while we were talking.”

“Stephen Wolfram was right about everything. Wolfram is the greatest physicist since Isaac Newton. Since Plato, even. Our meager, blind physics is just a subset of Wolfram’s new-kind-of-science metaphysics. He deserves fifty Nobels.”

“How many people have read that Wolfram book?” I asked him. “I hear that his book is, like, huge, cranky, occult, and it drives readers mad.”

“I read the forbidden book,” said Crawferd. “It’s not Steve Wolfram’s fault that the universe is a computationally equivalent Turing Machine that’s ninety-six percent hideous darkness. It’s just that . . .” He drew a trembling breath. “Well, once you

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understand that truth, you become a cosmic exile. You can never go home.”

“Crawferd,” I told him slowly, “this news of yours has put me into a headspace where I don’t think I can thrive.”

“Yeah,” said Crawferd. “It’s so awful. Truly. It turns out that networked matter is something we should never have messed with. It is ‘knowledge Man was not meant to know.’”

I didn’t know what to say to that. I’d never heard such a thing said to me by anybody. That whole paradigm made no sense to me. “Not meant to know?” How? Why? Meant by what?

Things not meant to be known were happening all around me, every day. Big Data apps—they were hot—were full of ‘knowledge’ no ‘man’ was ever going to ‘know.’ Wolfram’s Mathematica could answer millions of questions no man had ever asked. Even Siri blurted out awesome surreal cut-up bullshit that William Burroughs couldn’t match in Tangiers.

“I’ve been suffering,” said Crawferd, “living with cosmic reality for three weeks now. I’m surrounded by terrifying networks of dark matter and energy which are one keyboard tap away yet can never be detected with our human senses.”

He fidgeted with the phablet screen, which had gone all green and sickly. “It’s clear to me now that somehow bees get it. Bees operate at some unweilt scale of size and insectile perception where they don’t even have to read Stephen Wolfram. Did you ever see ‘Wax, of the Discovery of Television Among the Bees’? Greatest nature documentary ever.”

“I saw Wolfram lecture once in Chicago. He seemed like a decent guy. Maybe we can shoot him an email and get him to suppress his book before it’s too late for mankind.”

“It’s **ALWAYS TOO LATE!**” Crawferd shrieked in anguish. “Once you know about the cosmic code, the hints are everywhere! You can’t suppress that, it’s like calling up Shawn Fanning at Napster to shut down Metallica records! Of course I wish—a million times, God help me!—that I’d never opened that accursed book and exposed my mind to the hideous facts! Do you realize how **ANCIENT AND ELDRITCH** that Wolfram cosmic code is? It predates the universe of matter! The Big Bang was like its start-up chime.”

He doubled up choking with despair, and I had to pound his

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shoulder blades. I was lucky that as an industry promoter and marketing guy I'd never really grasped code. I couldn't take this half as hard as he did.

But even a layman isn't immune to software. I was catching on. It was dawning on me that "Man" didn't belong in the Cosmos. The Cosmos belonged to something else entirely, something vast and dark and chaotic and pretty much glitchware, and we people, the human user base, we were just phantoms flitting by on the surface of that, like so many lolcats.

Maybe you could see that setup as "funny." If so, it sure was very black, dark, punk, no-future funny. It was very cyber and it was also very nihilist punk. I could sort of get behind that. At least, I'd seen it around. Some kind of dread—but there was still something missing.

There needed to be some way that I could feel about this situation. Some strange, old-fashioned but authentic emotional reaction. Some sensibility, or paradigm, a philosophy, moral order, whatchamacallit, help me out here . . . But I just couldn't get there from where I mentally existed. It was like my permission screen was grayed-out.

"Crawferd," I said, "I know I'm not as smart as you . . . I'm just not feeling it. What is this? What is happening?"

"This is cosmic horror," said Crawferd.

"What's that?"

"It's the stark truth that the cosmos is horrible, Buzz. The universe is dark and ancient and monstrous, and hostile to our frail place within it. If we ever peek just once through a crack in the doors of perception, we shrivel into absurdist nothing, We're cackling madmen eating flies. We're mental mummies forever frozen in fear."

"What are we supposed to do about that? We're tech start-up people!"

He blinked emptily and plucked a stray nose hair from one watering nostril.

"Look, Crawferd, even if all that's true, why would you want to buy into that scene? I mean, that's true like Al Gore Global Warming is true. It's too big a bringdown to talk about in public."

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“It is true. I know it is, I proved it with computer science. I’ve got the cosmic code module. I can boot it from this phablet right here and now.”

I waved my hand at him. “You know what I’m hearing from you? I’m hearing a panic attack. Now I get it. This is just a crisis of confidence. You got all 2008 on me here.”

“My Makers were eaten by invisible Dark Energy monsters.”

“What are you supposed to do with that, post it in the comments section of io9? You’re a start-up guy who lost your unpaid interns. It happens! What has become of you, man? You used to be FUN! ‘Networking matter’ isn’t weird gloomy metaphysics! It’s a carnival of cool hacks that can turn the whole world on its ear!”

“Sure it’s metaphysical. Combining data with matter is always metaphysical.”

“You’re confusing stuff that’s ‘awesome’ with stuff that’s ‘awful’! Pull yourself together before it’s too late! ‘Networked Matter’ is like automated Segways that carry you around on Google Maps! It’s like Roomba Tiny Scrubble Bubbles that clean up all your mess! It’s a beautiful thing, the way forward, it’s win-win, it’s pure upside!”

“That’s what *I* used to see in the prospect,” mourned Crawferd. “I know you can’t help me anymore. I ate the Red Pill. The hallucinatory operators are real.”

Sadly, he opened a leftover bag of his AirBnB hostess’s dehydrated banana chips.

“All I have to do,” he said, munching tragically, “is to run my SourceForge code—and it’s so pig-simple that it’ll even run on this no-name Android device. Then my demo will trojan that Wolfram code into the spacetime that surrounds us.” He had a melancholy sip of stale Fanta. “And then, with your own weak human senses, you will understand why dogs howl at silence and cats scream at darkness. We will touch the intangible and eff the ineffable. We will dent the universe.”

Of course, we had to do it. It took him awhile to start the streaming mode for us—new media demos never work the first time.

Then, astoundingness started oozing into our meager little room. It was bright, raw, pure 1991-era Wired magazine “Astound Me”

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astoundingness, in design-award-winning chrome and hot pink, oozing right off the edge of the page.

Then the walls opened up or rather faded like a smoky mist. We could see that everyday objects, an amazing array of them—spoon to a city, bus to a body, cell to a sewage treatment plant—they all had a cloudy network tissue.

Spotlights of bleeding wireless radiance were shooting through this inferno of the material world. Powerful radiations blasted from devices that unknowing cloudy entities, hapless people, had clamped to their transparent skulls. Sheets of hard data radiation, auroras of it, were blasting straight in and out of their eyeballs, ears, and pineal glands. There were billions of these evil data barnacles out there, infesting every purse and pocket.

A hellish veil lifted over a decaying world of dead analog elder gods. Endless ranks of blacked-out stone columns that had once been as solid, trustworthy, and commonplace as the mystic pyramid on the back of a dollar bill. Now these temples of a lost time were rain-dampened slabs with their roofs torn off, cyclopean temples virally eaten away, reduced to mere vectors and voids, so many once-solid bricks horribly phantomized to pixelated clicks . . .

And then! Then the SOUND came, the ghost wail of Top 40 rock-n-roll that had once been on honest vinyl and delivered through weighty, high-performance quadrophonic speakers, yet now it was some nauseous, thin, maddening, nose-flute wub-wub with all its highs and lows snipped out by bit compression! A maddening, spiritually empty dance music from the court of a demon sultan who tormented so many mp3s that he'd never stop till the heat death of the universe!

Tormented beyond madness, poor Crawferd was staring past me, or rather straight through my flesh, and from the freaked expression on his gaunt face I was sure he was seeing much more than I.

Then from some dreadful tagged spot in geolocative extradimensionality came a seething, writhing cavalcade of immaterial shapes. These were the ghastly, tentacular exudations of a Dark Energy force in the universe—the multiplex arms of a face-sucking vampire squid, the dark lord of the mayhem around us that withered every mortal thing it could touch.

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This was a negative equity, a world-spanning, hideous, and implacable debt monster, a beast rising up under the floorboards into a bright and childlike high-technology world that had never known such aberrance existed!

My ears rang, my mouth filled with the panicked taste of my own blood, and suddenly I became possessed of an augmented insight. I saw, through this luminous and shadowy chaos, a machine code underpinning everything. I saw that the AirBnB room, and Crawlerd's little Android phablet, and our clothes, shoes, doorknobs, all these networkable objects, known and unknown, were all permeated by the hideous Dark Energy!

In their disgusting disarray, every one of these virtual tentacles was a monstrous composite of an unconscionable entity that fracked the bedrock while inflaming the sky! The dark tentacles overlapped, they were semi-fluid, always floating with malignant purpose! Sometimes, the incorporate tentacles feigned to destroy one another—for I could see a sudden undercutting and a vaporous billowing—but they were all parts of the same writhing extrageometric entity! Then I knew what had happened to Crawlerd's poor start-up slaves, what's her face and whatever his name was. They had venture-capitalled into this unholy maelstrom and they would never be seen again!

Something had to give, for soon we would be screaming our lungs out and hauling the papier-mâché puppets of our anxieties around the streets like Occupy tent derelicts. Then mercifully, something did indeed fail, crack, and die in a horrible spasm—Crawlerd's phablet.

Nothing called a “phablet” could ever be built to last. It was just a pirate toy, all forged components and no-name Chinese connectors. It had ignited its battery and blown itself into a spewing puddle of toxic plastic stink.

A bad graybar moment ensued then, like that painful pause when a provider cheats on broadband. Then, with a high-pitched yip and a visual warp, we were back in material existence. Just a few leftover hairballs of the truth, scampering off into dim corners like Tumblr gifs from a Studio Ghibli anime.

The rest of this I can tell pretty quickly. We left the smoldering plastic stink for our AirBnB hostess. We stumbled into the empty streets like madmen, disheveled, moaning, and without even a car, until we finally found a lit door that would take us in.

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We found ourselves in the welcome, kindly shelter of a globalized, highly efficient, chicken-networking, franchise KFC. I forced a hot tea and some extra crispy into the tormented genius. At least we were alive. Somehow we hadn't deserved to die in cosmic horror. I guess we hadn't lived up to the dignity of it.

Now what were we supposed to do—go to the *New York Times*? They've got a paywall! We'd glimpsed a frightening ultimate reality. But, mercifully, the sensation had faded.

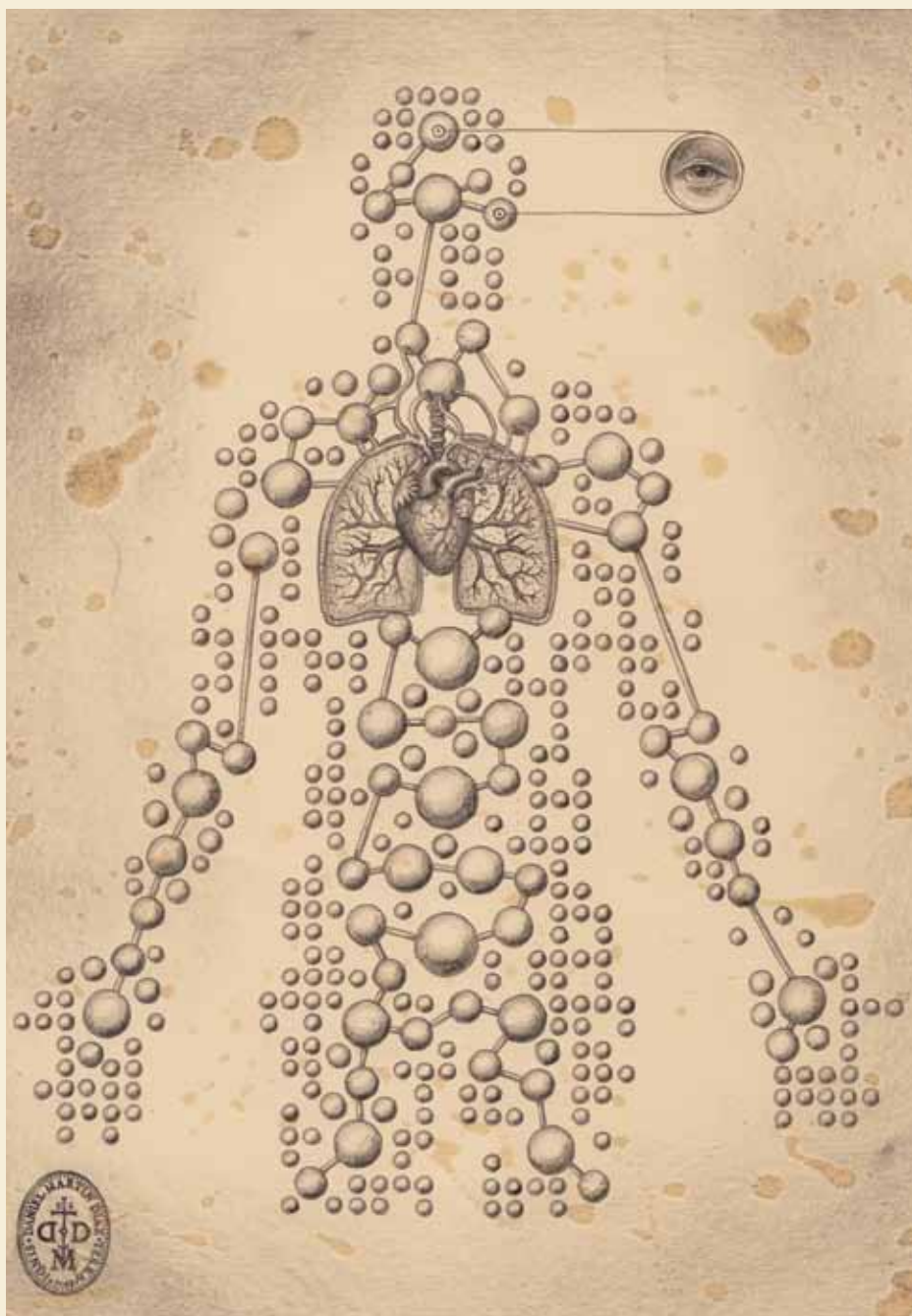
The sense of wonder has a short shelf life. Cosmic horror, a more intense, more spiritual feeling, even shorter yet. Nobody human can perceive reality at that cosmic level and still persist in daily life. Bees do that, maybe. Bees have been around longer than we have, and bees generally do a better job of keeping their shit together.

So we're shaking all over in the Kentucky Fried Chicken, wondering how we can live henceforth, or at least get more biscuits. Then we glance behind the counter because there's like a quarrel, or at least a noise. There's like two radically underemployed people in there, boxing the product.

These two are dead ringers for—no, they clearly ARE—Mary Shelley and Frankenstein. She's this sensitive poet's widow with an English degree and no means of financial support. He's this hulking, mute, underclass cyborg who's already the walking dead. We hadn't seen 'em when we came in. They hadn't seen us, either. Who ever looks?

They are in there minding the KFC optimized algorithms, and they are feeding us. And we're eating what they feed us. Lots. They don't want to be integral parts of that system, but they can't see any way out of it. They're manning a real life cyber supply chain that they don't perceive as such.

They have something pretty intense going on with each other, too. It's hairier than what we had going on.



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*Atomic Man*  
DANIEL MARTIN DIAZ

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VII.

BY HIS THINGS

WILL

YOU KNOW

HIM

BY  
*cory* DOCTOROW

I thought that Mr. Purnell was a little young to be a funeral director, but he had the look down *cold*. In the instant between his warm, dry handshake and my taking my hand back to remove my winter hat and stuff it into my pocket, he assumed the *look*, a kind of concerned, knowing sympathy that suggested he'd weathered plenty of grief in his day and he was there to help you get through your own. He gestured me onto an oatmeal-colored wool sofa and pulled his

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wheeled office chair around to face me. I hung my coat over the sofa arm and sat down and crossed and uncrossed my legs.

“So, it’s like I said in the email—” was as far as I got and then I stopped. I felt the tears prick at the back of my eyes. I swallowed hard. I rubbed at my stubble, squeezed my eyes shut. Opened them.

If he’d said *anything*, it would have been the wrong thing. But he just gave me the most minute of nods—somehow he knew how to embed sympathy in a tiny nod; he was some kind of prodigy of grief-appropriate body language—and waited while the lump in my throat sank back down into my churning guts.

“Uh. Like I said. We knew Dad was sick but not how sick. None of us had much to do with him for, uh, a while.” Fifteen years, at least. Dad did his thing, we did ours. That’s how we all wanted it. But why did my chest feel like it was being crushed by a slow, relentless weight? “And it turns out he didn’t leave a will.” Thanks, Dad. How long, how many years, did you have after you got your diagnosis? How many years to do one tiny thing to make the world of the living a simpler place for your survivors?

Selfish, selfish *prick*.

Purnell let the silence linger. He was good. He let the precisely correct interval go past before he said, “And you say there is insurance?”

“Funeral insurance,” I said. “Got it with his severance from Compaq. I don’t think he even knew about it, but one of his buddies emailed me when the news hit the web, told me where to look. I don’t know what his policy number was or anything—”

“We can find that out,” Purnell said. “That’s the kind of thing we’re good at.”

“Can I ask you something?”

“Of course.”

“Why don’t you have a desk?”

He shrugged, tapped the tablet he’d smoothed out across his lap. “I feel like a desk just separates me from my clients.” He gestured around his office, the bracketless shelves in somber wood bearing a few slim books about mourning, some abstract



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sculptures carved from dark stone or pale, bony driftwood. “I don’t need it. It’s just a relic of the paper era. I’d much rather sit right here and talk with you, face to face, figure out how I can help you.”

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I’d googled him, of course. I’d googled the whole process. The first thing you learn when you google funeral homes is that the whole thing is a ripoff. From the coffin—the “casket,” which is like a coffin but more expensive—to the crematorium to the wreath to the hearse to the awful online memorial site with sappy music—all a scam, from stem to stern. It’s a perfect storm of graft: a bereaved family, not thinking right; a purchase you rarely have to make; a confusion of regulations and expectations. Add them all up and you’re going to be mourning your wallet along with your dear departed.

Purnell gets good google. They say he’s honest, modern, and smart. They say he’s young, and that’s a positive, because it makes him a kind of digital death native, and that’s just what we need, my sister and I, as we get ready to bury Herbert Pink: father, nerd, and lifelong pain in the ass. The man I loved with all my heart until I was 15 years old, whereupon he left our mother, left our family, and left our lives. After that, I mostly hated him. You should know: hate is not the opposite of love.

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I was suddenly mad at this young, modern, honest, smart undertaker. I mean, *funeral director*. “Look,” I said. “I didn’t really even know my father, hadn’t seen him in years. I don’t need ‘help,’ I just need to get him in the ground. With a minimum of hand holding and fussing.”

He didn’t flinch, even though there’d been no call for that kind of outburst. “Bruce,” he said, “I can do that. If you’re in a hurry, we can probably even do it by tomorrow. It looks like your father’s insurance would take you through the whole process. We’d even pay the deductible for you.” He paused to let that sink in. “But Bruce, I *do* think I can help you. You’re your father’s executor, and he died intestate. That means a long, slow probate.”

“So what? I don’t care about any inheritance. My dad wasn’t a rich man, you know.”

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“I’m sorry, that’s not what I meant to imply. Your father died intestate, and there’s going to be taxes to pay, bills to settle. You’re going to have to value his estate, produce an inventory, possibly sell off his effects to cover the expenses. Sometimes this can take years.”

He let that sink in. “All right,” I said, “that’s not something I’d thought of. I don’t really want to spend a month inventorying my father’s cutlery and underwear drawer.”

He smiled. “I don’t suppose a court would expect you to get into that level of detail. But the thing is, there’s better ways to do this sort of thing. You think that I’m young for a funeral director.”

The non sequitur caught me off guard. “I, uh, I suppose you’re old enough—”

“*I am* young for this job. But you know what Douglas Adams said: everything invented before you were born is normal and ordinary and is just a natural part of the way the world works. Anything after your fifteenth birthday is new and exciting and revolutionary. Anything invented after you’re thirty-five is against the natural order of things. The world has changed a lot since you were born, and changed even more since *I* was born, and I have to tell you, I think that makes my age an asset, not a liability.

“And not in some nebulous, airy-fairy way. Specifically, the fact that I’m 27 years old is how I got onto the beta-test for this.” He handed me his tablet. I smoothed it out and looked at it. It took me a minute to get what I was seeing. At first, I thought I was looking through a live camera feed from some hidden webcam in his office, but then I noticed I wasn’t in the picture. Then I thought I might be seeing a video loop. But after a few experimental prods, I understood that this was a zoomable panoramic image of the room in which I was sitting.

“Pick up one of the sculptures,” he said. I zoom-dragged to one of them, a kind of mountainscape made of something black and nonreflective. It had pleasing proportions, and a play of textures I quite admired. I double-tapped it and it filled the screen, allowing me to rotate it, zoom in on it. Playing along, I zoomed way up until it became a mash of pixellated JPEG noise, then back out again.

“Now try the white one,” he said, pointing at a kind of mathematical solid that suggested some kind of beautiful calculus, behind him and to the left. Zooming to it, I discovered that I could go to

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infinite depth on it, without any jaggies or artifacts appearing. "It's so smooth because there's a model of it on Thingiverse, so the sim just pulled in the vectors describing it and substituted a rendering of them for the bitmap. Same with the shelves. They're Ikea, and all Ikea furniture has publicly disclosed dimensions, so they're all vector based." I saw now that it was true: the shelves had a glossy perfection that the rest of the room lacked.

"Try the books," he said. I did. A copy of *The Egyptian Book of the Dead* opened at a touch and revealed its pages to me. "Book-search scans," he said.

I zoomed around some more. The camel-colored coat hanging on the hook on the back of the door opened itself and revealed its lining. My pinky nail brushed an icon and I found myself looking at a ghostly line-art version of the room, at a set of old-fashioned metal keys in the coat's pocket, and as I zoomed out, I saw that I was able to see into the walls—the wiring, the plumbing, the 2'4 studs.

"Terahertz radar," he said, and took the tablet back from me. "There's more to see, and it gets better all the time. There were a couple of books it didn't recognize at first, but someone must have hooked them into the database, because now they move. That's the really interesting thing, the way this improves continuously—"

"Sorry," I said. "What are you showing me?"

"Oh," he said. "Right. Got ahead of myself. The system's called Infinite Space and it comes from a start-up here in Virginia. They're a DHS spinout, started out with crime-scene forensics and realized they had something bigger here. Just run some scanners around the room and give it a couple of days to do the hard work. If you want more detail, just unpack and repack the drawers and boxes in front of it—it'll tell you which ones have the smallest proportion of identifiable interior objects. You won't need to inventory the cutlery; that shows up very well on a terahertz scan. The underwear drawer is a different matter."

I sat there for a moment, thinking about my dad. I hadn't been to his place in years. The docs had shown me the paramedics' report, and they'd called it "crowded," which either meant that they were very polite or my dad had gotten about a million times neater since I'd last visited him. I'd been twenty before I heard the term "hoarder," but it had made instant sense to me.

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Purnell was waiting patiently for me, like a computer spinning a watch cursor while the user was woolgathering. When he saw he had my attention, he tipped his head minutely, inviting me to ask any questions. When I didn't, he said, "You know the saying, 'You can't libel the dead'? You can't invade the dead's privacy, either. Using this kind of technology on a living human's home would be a gross invasion of privacy. But if you use it in the home of someone who's died alone, it just improves a process that was bound to take place in any event. Working with Infinite Space, you can even use the inventory as a checklist, value all assets using current eBay blue-book prices, divide them algorithmically or manually, even turn it into a packing and shipping manifest you can give to movers, telling them what you want sent where. It's like full-text search for a house."

I closed my eyes for a moment. "Do you know anything about my father?"

For the first time, his expression betrayed some distress. "A little," he said. "When you showed up in my calendar, it automatically sent me a copy of the coroner's report. I could have googled further, but . . ." He smiled. "You can't invade the privacy of the dead, but there's always the privacy of the living. I thought I'd leave that up to you."

"My father kept things. I mean, he didn't like to throw things away. Nothing." I looked into his eyes as I said these words. I'd said them before, to explain my spotless desk, my habit of opening the mail over a garbage can and throwing anything not urgent directly into the recycling pile, my weekly stop at the thrift-store donation box with all the things I'd tossed into a shopping bag on the back of the bedroom door. Most people nodded like they understood. A smaller number winced a little, indicating that they had an idea of what I was talking about.

A tiny minority did what Purnell did next: looked back into my eyes for a moment, then said, "I'm sorry."

"Yeah," I said. "He was always threatening to start an antique shop, or list his stuff on eBay. Once he even signed a lease, but he never bought a cash register. Never unlocked the front door, near as I could tell. But he was always telling me that his things were valuable, to the right person." I swallowed, feeling an echo of the old anger I'd suppressed every time he'd played that loop for me. "But if there was anything worth anything in that pile, well, I don't know how I'd find it amid all the junk."

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“Bruce, you’re not the first person to find himself in this situation. Dealing with an estate is hard at the best of times, and times like this, I’ve had people tell me they just wanted to torch the place, or bulldoze it.”

“Both of those sound like good ideas, but I have a feeling you don’t offer those particular services.”

He smiled a little funeral director’s smile, but it went all the way to his eyes. “No,” he said. “I don’t. But, huh.” He stopped himself. “This sounds a bit weird, but I’ve been looking forward to a situation like this. It was what I thought of immediately when I first saw Infinite Space demoed. This is literally the best test case I can imagine for this.”

I wish I was the kind of guy who didn’t cry when his father, estranged for decades, died alone and mad in a cluttered burial chamber of his own lunatic design. But I’d cried pretty steadily since I’d gotten the news. I could tell that I was about to cry now. There were Kleenex boxes everywhere. I picked one up and plucked out a tissue. Purnell didn’t look away but managed to back off slightly just by altering his posture. It was enough to give me the privacy to weep for a moment. The tears felt good this time, like they had somewhere to go. Not the choked cries I’d found myself loosing since I’d first gotten the news.

“Yeah,” I said. “Yeah, I think it probably is.”

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I’d expected Roomba-style rolling robots and wondered how they’d get around the narrow aisles between the drifts and piles of things in Dad’s house. There were a few of those, clever ones, the size of my old Hot Wheels cars, and six-wheeled so they could drive in any direction. But the heavy lifting was done by the quadrotors, each the size of a dragonfly, swarming and swooping and flocking with an eerie, dopplered whine that bounced around in the piles of junk. Bigger rotors went around and picked up the ground-effect vehicles, giving them lifts up and down the stairs. As they worked, their data streamed back into a panorama on Purnell’s laptop. We sat on the porch steps and watched the image flesh out. The renderer was working from bitmaps and dead-reckoning telemetry to build its model, and it quivered like a funhouse as it continuously refined its guesses about the dimensions. At one point, the living room sofa appeared to pierce the wall behind us, the sofa itself rendered as a kind of eye-wateringly impossible

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Escherling that was thick and thin simultaneously. The whole region glowed pink.

“See,” Purnell said. “It knows that there’s something wrong there. There’s going to be a ton of quads tasked to it any second now.” And we heard them buzzing through the wall as they conferred with one another and corrected the software’s best guesses. Flicking through the panoramas, we saw other pink areas, saw them disappear as the bad geometries were replaced with sensible ones in a series of eyeblink corrections. There was something comforting about watching all the detail fill in, especially when the texturemaps appeared in another eyeblink, skinning the wireframes and giving the whole thing the feeling of an architectural rendering. The bitmaps had their own problems: improbable corners, warped-mirror distortions, but I could see that the software was self-aware enough to figure out its own defects, painting them with a pink glow that faded as the approximations were fined down with exact images from the missing angles.

All this time, there’d been a subtle progress bar creeping in fits and starts across the bottom of the screen, just few pixels’ worth of glowing silverly light, and now it was nearly all the way. “You don’t have to do the next part,” he said. “If you’d rather wait out here—”

“I’ll do it,” I said. “It’s okay.”

“They gave us eight scanners. That’s more than we should need for a two-bedroom house. Two should do it. One, even, if you don’t mind moving it, but I thought—”

“It’s okay,” I said again. “I can do this.”

I shook my own tablet out and pinched it rigid, holding it before me like a treasure map as I walked through the front door.

The smell stopped me in my tracks. It had been teasing me all the morning on the porch, but that was the attenuated, diluted version. Now I was breathing in the full-strength perfume, the smell of all my fathers’ dens: damp paper, oxidizing metal, loose copper pennies, ancient cleaners vaporizing through the pores in their decaying bottles, musty cushions, expired bulk no-name cheerios, overloaded power strips, mouse turds, and the trapped flatulence of a thousand lonely days. Overlaid with it, a rotten meat smell.

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My father had been dead for at least a week before they found him.

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Infinite Space wanted terahertz scanners in several highly specific locations. Despite Purnell's assurances, it turned out that we needed to reposition half a dozen of them, making for fourteen radar panoramas in all. I let him do the second placement and went back out onto the porch to watch the plumbing and structural beams and wiring ghost into place as the system made sense of the scans. I caught a brief, airport-scan flash of Purnell's naked form, right down to his genitals, before the system recognized a human silhouette and edited it out of the map. The awkwardness was a welcome change from the cramped, panicked feeling that had begun the moment I'd stepped into Dad's house.

The screen blinked and a cartoon chicken did a little ironic head tilt in the bottom left corner. It was my little sister, Hennie, who is much more emotionally balanced than me, hence her ability to choose a self-mocking little avatar. I tapped and then cupped the tablet up into a bowl shape to help it triangulate its sound on my ear. "Have you finished mapping the burial chamber, Indiana Bruce?" She's five years younger than me, and Dad left when she was only ten, and somehow it never seemed to bother her. As far as she was concerned, her father died decades ago, and she'd never felt any need to visit or call the old man. She'd been horrified when she found out that I'd exchanged a semi-regular, semi-annual email with him.

I snuffled up the incipient snot and tears. "Funny. Yeah, it's going fast. Mostly automatic. I'll send it to you when it's done."

She shook her head. "Don't bother. It'll just give Marta ideas." Marta, her five-year-old daughter, refused to part with so much as a single stuffed toy and had been distraught for months when they remodeled the kitchen, demanding that the old fridge be brought back. I never wanted to joke about heredity and mental illness, but Hennie was without scruple on this score and privately insisted that Marta was just going through some kind of essential post-toddler conservatism brought on by the change to kindergarten and the beginning of a new phase of life.

"It's pretty amazing, actually. It's weird, but I'm kind of looking forward to seeing the whole thing. There's something about all that mess being tamed, turned into a spreadsheet—"

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“Listen to yourself, Bruce. The opposite of compulsive mess isn’t compulsive neatness—it’s general indifference to stuff altogether. I don’t know that this is very healthy.”

I felt an irrational, overarching anger at this, which is usually a sign that she’s right. I batted it down. “Look, if we’re going to divide the estate, we’re going to have to inventory it, and—”

“Wait, what? Who said anything about dividing anything? Bruce, you can keep the money, give it to charity, flush it down the toilet, or spend it on lap dances for all I care. I don’t want it.”

“But half of it is yours—I mean, it could go into Marta’s college fund—”

“If Marta wants to go to college, she can sweat some good grades and apply for a scholarship. I don’t give a damn about university. It’s a big lie anyway—the return on investment just isn’t there.” Whenever Hennie starts talking like a stockbroker, I know she’s looking to change the subject. She can talk economics all day long, and will, if you poke her in a vulnerable spot.

“Okay, okay. I get it. Fine. I won’t talk about it with you if it bugs you. You don’t have to know about it.”

“Come on, Bruce, I don’t mean it that way. You’re my brother. You and Marta and Sweyn”—her husband—“are all the family I’ve got. I just don’t understand why you need to do this. It’s got me worried about you. You know that you had no duty to him, right? You don’t owe him anything.”

“This isn’t about him. It’s about me.” *And you*, I added to myself. *Someday you’ll want to know about this, and you’ll be glad I did it.* I didn’t say it, of course. That would have been a serious tactical mistake.

“Whatever you say, Bruce. Meantime, and for the record, Sweyn’s looked up the information for the intestasy trustee. Anytime you want, you can step away from this. They’ll liquidate his estate, put the proceeds into public-spirited projects. You can just step away anytime. Remember that.”

“I’ll remember. I know you want to help me out here, but seriously, this is something I need to do.”

“This is something you think you need to do, Bruce.”

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“Yeah,” I said. “If that makes you feel better, then I can go with that.”

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I got the impression that Infinite Space was tremendously pleased to have hit on a beta tester who was really ready to put their stuff through its paces. A small army of turkers were bid into work, filling in descriptions and URLs for everything the software couldn't recognize on its own. At first they'd been afraid that we'd have to go in and rearrange the piles so that the cameras could get a look at the stuff in the middle, but a surprising amount of it could be identified edge on. It turns out books aren't the only thing with recognizable spines, assuming a big and smart enough database. The Infinities (yes, they called themselves that, and they generated a near-infinite volume of email and tweets and statuses for me, which I learned to skim quickly and delete even faster) were concerned at first that it wouldn't work for my dad's stuff because so much of their secret sauce was about inferences based on past experience. If the database had previously seen a thousand yoga mats next to folded towels, then the ambiguous thing on top of a yoga mat that might be a fitted sheet and might be a towel was probably a towel.

Dad's teetering piles were a lot less predictable than that, but as it turned out, there was another way. Since they had the dimensions and structural properties for everything in the database, they were able to model how stable a pile would be if the towels were fitted sheets and vice-versa, and whittle down the ambiguities with physics. The piles were upright, therefore they were composed of things that would be stable if stacked one atop another. The code took very little time to implement and represented a huge improvement on the overall database performance.

“They're getting their money's worth out of you, Bruce,” Purcell told me, as we met in his office that week. He had my dad's ashes, in a cardboard box. I looked at it and mentally sized it up for its regular dimensions, its predictable contents. They don't put the whole corpse worth of ashes in those boxes. There's no point. A good amount of ashes are approximately interchangeable with all the ashes, symbolically speaking. The ashes in that box would be of a normalized distribution and weight and composition. They could be predicted with enormous accuracy, just by looking at the box and being told what was inside it. Add a terahertz scan—just to be sure that the box wasn't filled with lead fishing weights or cotton candy—and the certainty skyrockets.

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I hefted the box. “You could have dinged the insurance for a fancy urn,” I said.

He shrugged. “It’s not how I do business. You don’t want a fancy urn. You’re going to scatter his remains. An urn would just be landfill, or worse, something you couldn’t bring yourself to throw away.”

“I can bring myself to throw anything away,” I said, with half a smile. Quipping. Anything to prolong the moment before that predictable box ended up in my charge. In my hands.

He didn’t say anything. Part of the undertaker’s toolkit, I suppose. Tactful silence. He held the box in the ensuing silence, never holding it out to me or even shifting it subtly in my direction. He was good. I’d take it when I was ready. I would never be ready. I took it.

It was lighter than I thought.

\* \* \*

“Hennie, I need to ask you something and you’re not going to like it.”

“It’s about him.”

“Right,” I said. I stared at the ceiling, my eyes boring through the plaster and beams into the upstairs spare room, where I’d left the box, in the exact center of the room, which otherwise held nothing but three deep Ikea storage shelves—they’d render beautifully, was all I could think of when I saw them now—lined with big, divided plastic tubs, each neatly labeled.

“Bruce, I don’t want—”

“I know you don’t. But look, remember when you said I was all the family you had left?”

“You and Mattie and Sweyn.”

“Yes. Well, you’re all I have left, too.”

“You should have thought of that before you got involved. You’ve got no right to drag me into this.”

“I’ve got Dad’s ashes.”

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That broke her rhythm. We'd fallen into the bickering cadence we'd perfected during a thousand childhood spats where we'd demanded that Mom adjudicate our disputes. Mom wasn't around to do that anymore. Besides, she'd always hated doing it and made us feel like little monsters for making her do so. I don't know that we'd had a fight like that in the seven years since she'd been gone.

"Oh, Bruce," she said. "God, of course you do. I don't want them."

"I don't want them either. I was thinking I'd, well, scatter them."

"Where? In his house? Another layer of dust won't hurt, I suppose."

"I don't think that's a good idea. What about by Mom's grave?"

"Don't you *dare*." The vicious spin on the last word was so intense I fumbled my tablet and had to catch it as it floated toward the floor on an errant warm air current.

"Sorry," I said.

"He never *earned* the right to be with Mom. He never earned what you're giving him. He never earned me sparing a single brain cell for him. He's not worth the glucose my neurons are consuming."

"He was sick, Hennie."

"He did *nothing* to get better. There are meds. Therapies. When I cleaned out Mom's place, I found the letters from the therapists she'd set him up with, asking why he never showed up for the intake appointments. He did nothing to earn any of this."

It dawned on me that Hennie had dealt with all of Mom's stuff without ever bothering me. Mom had left a will, of course, and set out some bequests for me, and she hadn't lived in a garbage house. But it must have been a lot of work, and Hennie had never once asked for my help.

"I'm sorry, Hennie, I never should have bothered you. You're right."

"Wait, Bruce, it's okay—"

"No, really. I'll deal with this. It's just a box of ashes. It's just stuff. I can get rid of stuff."

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“Are you okay?”

“I’m fine,” I said. I was, too. I folded the tablet up and stuck it in the sofa cushions and stared at the ceiling for a moment longer.

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Somewhere in this house, there is an answer. Was there a moment when the grave robbers of ancient Egyptian pyramids found the plunder before them shimmer and change? Did they stand there, those wreckers with their hammers and shovels and treasure sacks, and gasp as the treasure before them became, for an instant, something naked and human and desperate, the terrified attempt of a dying aristocrat to put the world in a box, to make it behave itself? A moment when they found themselves standing not in a room full of gold and gems, but a room full of disastrous attempts to bring the universe to heel?

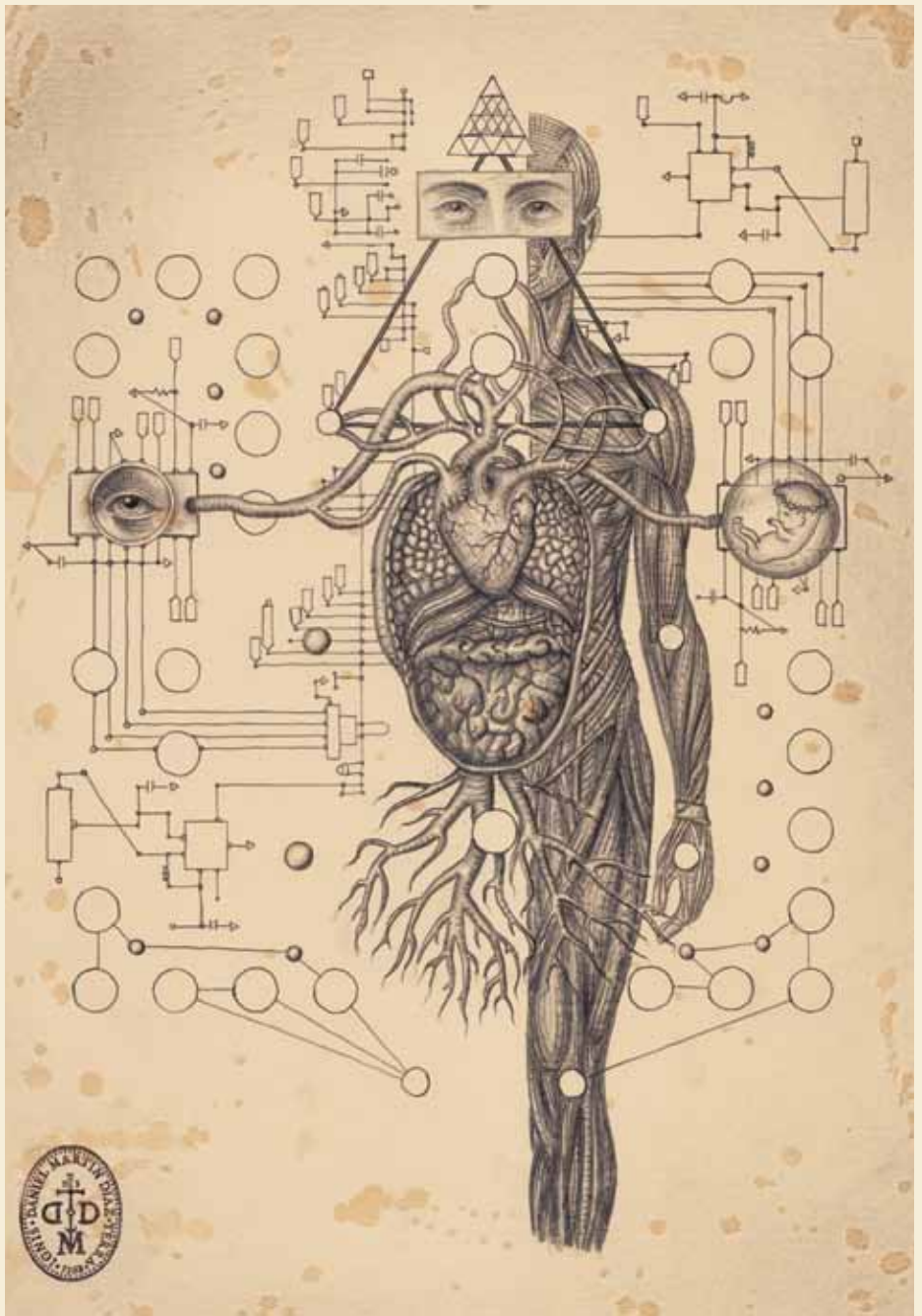
Here’s the thing. It turns out that I don’t mind mess at all. What I mind is *disorganization*. Clutter isn’t clutter once it’s been alphabetized on a hard drive. Once it’s been scanned and cataloged and put in its place, it’s stuff. It’s actionable. With the click of a button, you can list it on eBay, you can order packers and movers to get rid of it, you can search the database for just the thing to solve any problem.

Things are wonderful, really. Things are potential. The right thing at the right moment might save a life, or save the day, or save a friendship. Any of these things might someday be a gift. If times get tight, these things can readily be converted to cash. Honestly, things are really, really fine.

I wish Hennie would believe me. She freaked out when I told her I was moving out of my place into Dad’s. Purcell, too, kept coming over all grief counselor and trying to help me “process” what I was feeling. Neither of them gets it, neither of them understands what I see when I look into the ruin of Dad’s life, smartened up as neat as a precision machine. Minimalism is just a crutch for people who can’t get a handle on their things. In the modern age, things are adaptive. They’re pro-survival.

Really, things are fine.





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*Self-Aware System*  
DANIEL MARTIN DIAZ

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*the*  
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Madeline Ashby is a science fiction writer and strategic foresight consultant living in Toronto. Her debut novel, *vN: The First Machine Dynasty* is available from Angry Robot Books; the sequel, *iD*, will be available this summer. Her criticism has appeared at Boing Boing, The Creators Project, io9.com and Tor.com. You can find her at [madelineashby.com](http://madelineashby.com), or on Twitter @madelineashby.

## Daniel Martin Diaz

Daniel Martin Diaz's artwork has been exhibited in more than 50 solo and group exhibitions in 17 states and eight countries, including three international touring exhibitions. His latest artist monograph is titled *Soul of Science*. Diaz's art has also been commissioned for the PBS documentary *The Forgetting: A Portrait of Alzheimer's*, as cover art for albums by P.O.D. and Good Charlotte, and for two large altar pieces for San Antonio de Padua Catholic Church in Guaymas, Mexico. His public art includes the design and installation of the proscenium stage at Tucson, Arizona's historic Hotel Congress and a five-hundred-foot terrazzo floor for Phoenix's Sky Harbor International Airport. Diaz and his wife/collaborator Paula Catherine Valencia are the proprietors of Mysticus Publishing and Sacred Machine Museum in Tucson, and co-founders of the band Blind Divine. More at [danielmartindiaz.com](http://danielmartindiaz.com).

## Cory Doctorow

Cory Doctorow ([craphound.com](http://craphound.com)) is a science fiction author, activist, journalist, and blogger -- the co-editor of Boing Boing ([boingboing.net](http://boingboing.net)) and the author of young adult novels like *Pirate Cinema* and *Little Brother* and novels for adults like *Rapture of the Nerds and Makers*. He is the former European director of the Electronic Frontier Foundation and co-founded the UK Open Rights Group. He holds an honorary doctorate in computer science from the Open University (UK), where he is a Visiting Professor; in 2007, he served as the Fulbright Chair at the Annenberg Center for Public Diplomacy at the University of Southern California. Born in Toronto, Canada, he now lives in London.



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## Warren Ellis

Warren Ellis is the award-winning writer of graphic novels like *Transmetropolitan*, *Fell*, *Ministry of Space*, and *Planetary*, and the author of the “underground classic” novel *Crooked Little Vein*. The movie *Red* is based on his graphic novel of the same name, its sequel being due in summer 2013. His *Gravel* books are in development for film, with Tim Miller attached to direct, and his novel *Gun Machine* has been pre-emptively bought for television. *Iron Man 3* is based on his Marvel Comics graphic novel *Iron Man: Extremis*. He’s also written extensively for *Vice*, *Wired UK*, and *Reuters* on technological and cultural matters, and is co-writing a video project called *Wastelanders* with Joss Whedon. Warren Ellis is currently working on another novel for Mulholland Books, and a nonfiction book about the future of the city for Farrar Giroux Straus.

## David Pescovitz

David Pescovitz is a research director at Institute for the Future and co-editor/managing partner of Boing Boing, the technology and culture Web site with more than five million monthly readers. He is also editor-at-large for *MAKE*:, the DIY technology quarterly. Pescovitz co-wrote the book *Reality Check*, based on his long-running futurist column in *Wired* magazine, and has contributed to the *New York Times*, *Scientific American*, *Salon*, *New Scientist*, and *Flash Art*. His writings on art, science, and culture are featured in the books *What Are You Optimistic About?*, *The Happy Mutant Handbook*, *Hi-Fructose Collected Edition Vol. 1*, and *The 'Zine Reader*. From 2000 to 2007 he was the first ever writer-in-residence at UC Berkeley’s College of Engineering. Pescovitz holds a Bachelor of Fine Arts in Electronic Media from the University of Cincinnati and a Master’s in Journalism from UC Berkeley.

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## *Ramez Naam*

Ramez Naam is a computer scientist who spent 13 years at Microsoft. He's also the H.G. Wells Award-winning author of multiple books, including a recent nonfiction book on innovating to save the world, *The Infinite Resource: The Power of Ideas on a Finite Planet*; and the near-future neurotech thriller *Nexus*, and its forthcoming sequel, *Cruz*. He lives in Seattle where he writes and speaks full time. You can find him on Twitter @ramez or at his website, [rameznaam.com](http://rameznaam.com).

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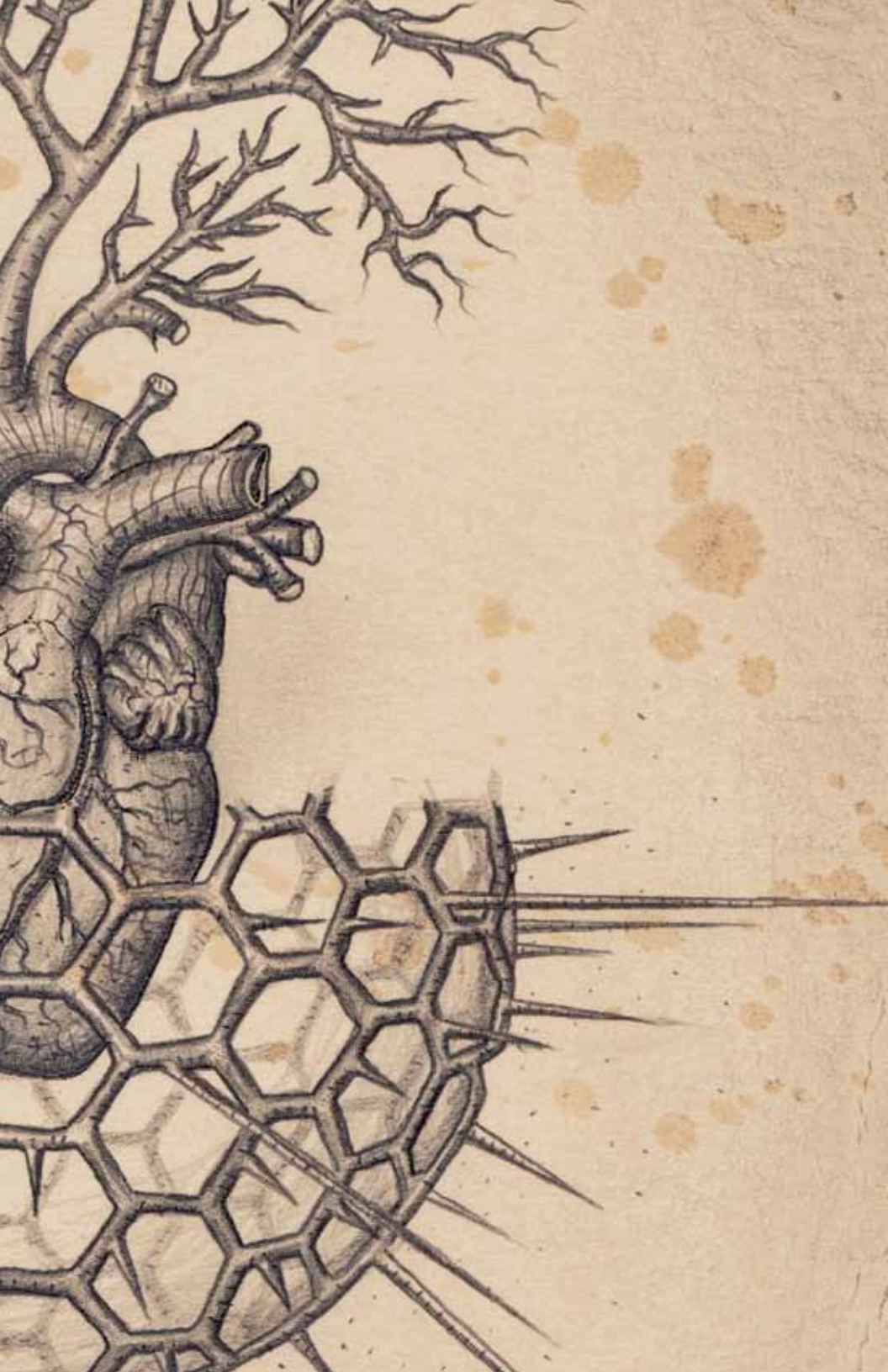
Rudy Rucker is a writer, a mathematician, and an emeritus computer science professor. He received Philip K. Dick awards for his cyberpunk novels *Software* and *Wetware*, available in the *Ware Tetralogy*. He recently published his autobiography, *Nested Scrolls*, and a beatnik SF novel, *Turing & Burroughs*, featuring Alan Turing and William Burroughs wreaking havoc on 1950s America. More info at [rudyrucker.com](http://rudyrucker.com).

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A futurist, journalist, science-fiction author and design critic, Bruce Sterling is best known for his novels and his seminal work on the *Mirrorshades* anthology, which defined the cyberpunk genre. His nonfiction works include *The Hacker Crackdown: Law and Disorder on the Electronic Frontier*, *Tomorrow Now: Envisioning the Next Fifty Years*, and *Shaping Things*. He is a contributing editor of *Wired* magazine, for which he writes on a wide range of topics, including politics, globalization and offshoring, technology and security, and the potential of NGOs. He also writes a weblog. During 2005 and 2011, Sterling was the "visionary in residence" at Art Center College of Design in Pasadena.







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# IX.

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*ABOUT*  
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