

THE TOMORROW PROJECT ANTHOLOGY



CAUTIONS DREAMS & CURIOSITIES

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1,000

I have spent the last 960 mornings of my life on the phone with Joe Zawadsky. Joe is the engine that drives The Tomorrow Project. His passion and enthusiasm give us the ability to span the globe having conversations about the future. Joe has run The Tomorrow Project for the last four years. We have a standing phone call each morning to talk about the status of the various projects we have going on all over the world.

The calls usually go like this:

Joe Z.: “Hello . . .”

BDJ: “Good morning, Joe Zawadsky!” (Yes, I usually yell that part because it’s early and it helps wake us both up.)

Joe Z. [chuckling]: “Good morning, Brian. How are you this morning?”

BDJ: “I’m doing great, Joe. How are you?”

This is where I find out what kind of call it’s going to be. I’ve worked with Joe long enough that I can tell how he’s doing by the tone of his voice and his mannerisms. I can tell if he’s stressed about a legal contract or if he’s worried about an event that’s coming up, but I can also tell when he’s excited. I love it when Joe’s excited. It means he has good news.

When Joe gets excited he laughs a little and stutters before he starts to talk. This is my cue to get excited. This year at The Tomorrow Project we had a lot of good news, like this:

BDJ: “How is The Tomorrow Project Brazil going?”

Joe Z.: “Well . . . [quick, excited laugh] Well . . . you see Brian. You see . . . [quick laugh] We got over 300 submissions from Brazil. 300!”

BDJ: “Wow! That’s awesome!”

Joe Z.: “I know! It’s REALLY amazing!”

BDJ: “How many stories do we have now? We’ve gotten so many this year. How many do we have in total?”

Joe Z.: Well Brian . . . [quick, excited laugh] We’re getting pretty close to 1,000.”

GETTING TO 1,000

This year The Tomorrow Project passed a milestone that both humbles me and blows my mind. We passed the 1,000-submissions mark. Each submission captures a vision of the future from people all over the world. Most are science fiction stories based on science fact, while others are interviews, comics, movies, artwork, essays, podcasts and especially passionate opinions. We have over 1,000 now and I find that truly incredible. Each one is a personal vision, a commentary on a future that someone wants or a future that they want to avoid. They have shared it with us and everyone else who might be interested in the future. 1,000. How generous. How amazing.

The goal of the project has always been the same: Have fact-based, science-based conversations about the future. Get people talking about the futures they want

and the futures they want to avoid. That's it. Just create conversations so that we can all be active participants in our future.

These conversations have been moving all over the world. We started in Germany, and have been to the United States, England, Brazil, and China—and we're just getting started! Along the way we've talked with some truly amazing people, from working scientists and engineers to science fiction writers and regular folks who are passionate about the future.

These 1,000 visions in their different forms and languages show how engaged people can be in our future. They embrace the fact that we all build the future each day, and that to build it we all must have our own vision of that future so that we can actively work to bring it into being.

Nothing amazing was ever built by humans that was not first imagined. Each of those 1,000 visions is a personal dream for the future, a call to action, a warning, and a hope for tomorrow. Embedded inside them you will find our humanity and the seed of a future that is radically better than the future we're living in today. 1,000 possibilities. 1,000 conversations that will change the stories that we tell ourselves about the future we will live in.

HUMANS ARE CAPABLE OF WORKING MAGIC

Carl Sagan happily haunts The Tomorrow Project. Sagan was a trained physicist and astronomer, but he was best known as an author of science fiction and science fact with more than 20 books, as well as a science popularizer and communicator. He rose to his greatest notoriety for his award-winning 1980 TV series *Cosmos: A Personal Journey* that he starred in and also co-wrote.

Cosmos is one of the most watched TV series in the world and covers a wide range of topics from the life of stars to the human brain. In Episode 11, “The Persistence of Memory,” Sagan talks about books, the written word and the power to capture our visions to share with others:

What an astonishing thing a book is. It's a flat object made from a tree with flexible parts on which are imprinted lots of funny dark squiggles. But one glance at it and you're inside the mind of another person, maybe somebody dead for thousands of years. Across the millennia, an author is speaking clearly and silently inside your head, directly to you. Writing is perhaps the greatest of human inventions, binding together people who never knew each other, citizens of distant epochs. Books break the shackles of time. A book is proof that humans are capable of working magic.

The 1,000 visions in The Tomorrow Project have done just that. They have captured the future and broken the shackles of time. These visions have been shared all over the world and will continue to touch generations of curious minds.

They may not have known it but each author, each person that has contributed to The Tomorrow Project, has not only captured the DNA of tomorrow — they have also proved that they can do magic, and that we human beings have the ability to build our own future.

DREAMERS & STORYTELLERS, SCIENTISTS & ARTISTS

Edward O. Wilson is the world's leading expert on ants. He's also a Pulitzer Prize-winning biologist that's written a mountain of books (most of them about ants) and taught thousands of young minds at Harvard University.

In his recent book *Letters to a Young Scientist* Wilson illuminates one of the ideas we've been striving to express with The Tomorrow Project: At their very core science and storytelling come from the same place.

Innovators in both literature and science are basically dreamers and storytellers. In the early stages of both literature and science, everything in the mind is a story.

Science needs storytelling and storytelling needs science. The 1,000 visions of The Tomorrow Project serve many purposes. They not only excite conversations but they can actually help guide science and engineering, the building blocks of our future. They can inform government policy and media opinions. One need not be a Sagan or a Wilson to get involved.

These magic visions from The Tomorrow Project and the ones contained in this anthology have the power to shape our future. This collection brings together tomorrows from a wide range of ages and nationalities. We have contributions from world famous scientists and hardworking students. Some are written by *New York Times* Bestselling authors while most are from average people with a passion for tomorrow. Each captures a vision for the future, some sought after and some to be avoided. Each is a little piece of magic, a hope, a first step. 1,000 visions is just the first step. Always remember:

You can change the future.

Brian David Johnson
On a 737 over the West Coast of the United States of America

GRAND VISIONS AND BIG CHALLENGES



Of all the animals on this planet we humans are perhaps the strangest. Extremely intelligent with brains too big to be birthed through hips that could run, we are born half-baked. To survive each of us must learn more than the young of any other species. We educate each other, discover the new and communicate knowledge between individuals at a rate that makes us truly unique. We are machines of inquiry, discovery and communication. Perhaps the prime engine that drives this behavior within us is our curiosity.

We humans are an unbelievably curious bunch. Since the dawn of being human we have explored what we find around us and that exploration has taught us about our world, our universe and ourselves. It has shaped our society, spread our species across the globe, put men on the Moon, rovers on Mars and sent human influence outside the bounds of our solar system into interstellar space.

When we think of human exploration we think of exploring the outside. Whether it is *Soujourner*, Lewis and Clark, Shackleton in the Southern Seas, or the *Curiosity* rover on Mars, we think of exploration as being a discovery of what is outside. But human exploration is not just that. We humans also explore within, in the form of thought. Through uniquely human gestures such as art, music and philosophy we explore the realm of ideas and emotions—a universe of infinite possibilities. This universe is freed from the laws that govern the universe we know, the laws of time and space and matter. In the imagined universe one is free to find or create anything.

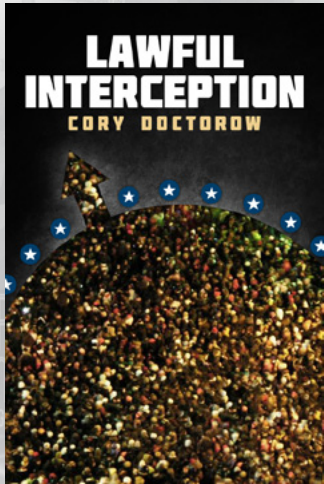
Introduction: Machines of Inquiry
Adam Steltzner

One of the most intriguing explorations of that universe of infinite possibilities is the writing of science fiction. The writing (and reading!) of science fiction explores that universe of infinite possibilities, partially constrained or tied to our physical universe, the one defined by our science. Science fiction juxtaposes the freedom of creating a new universe with some of the constraints of the one we know today. At its most profound, science fiction takes us to new realms of thought and contemplations of our own identity. At its most prophetic, it glimpses the edge of the universe that just might be—the one just over our time horizon.

As a college student, I was obsessed with science fiction. I was a reformed wannabe rock star-come-engineering devotee and the works of Niven, Asimov, Clarke, Dick and Heinlein fascinated me. I would study the universes that these authors painted, trying to differentiate science fact from fiction. Perhaps that is one of the great gifts of science fiction: it can paint a world so self-consistent that it leaves you to guess as to what is real and what is imagined. That same gift sometimes stretches us to create the fact foreseen in the imagined fiction, like the video watch in Dick Tracy and the submarines of Jules Verne.

The collection here is just such fiction: imagined near futures with dream modifying machines, food resources crises, DIY plant genetics and other not too far-fetched twists on the universe we know today. These stories blend science and fiction, leading the reader to wonder what is fact, what is fiction and what fiction might someday soon be fact. These stories tempt the reader to glimpse the future from the imaginations of the authors. Science fiction is a great playground for our minds, a place for our curiosity to run free. Exercise your mind, spool your curiosity, rake these stories for what might be and perhaps a glimpse of what is to come next.

Adam Steltzner
NASA Engineer



LAWFUL INTERCEPTION

by Cory Doctorow

© Cory Doctorow



ARIZONA STATE UNIVERSITY

If you grow up in San Francisco, you grow up with a bone-deep sense of what it means when the ground starts to move: *quake*. The first quake I remember was just a little tremor, a 2.8, but whether it's the big one or a little dish-rattler, there's no experience in the world like the experience of having the *ground* start to *move*. It's wrong like a seeing a broken bone sticking out of your skin, wrong like being carried upside down, wrong like trying to sign your name with your non-dominant hand, but times a bazillion. I was six when that little dish-rattler knocked the knickknacks off the shelves, and as I recall, I went from sitting on the living room sofa to crouching under the kitchen table by *teleportation*, or at least I moved so fast and so automatically that I have no recollection of consciously deciding to move.

When the Seneca quake hit, I was halfway from Oakland airport to Coliseum BART, on the shuttle bus, and again, *wham*, one minute we were tootling down the road and the next, the road buckled and the bus was tilted 45' up and to the right, and we were all rolling toward the back, flailing or curling up into protective balls, and there was a sound like a burrito finding its way through the digestive system of a cow the size of the galaxy, a rrrrrrrumble that went right up through your skin to your bones and joints, more felt than heard. When it stopped, the sound got louder: car alarms, crashing buildings, screams.

That wasn't a good day.



I remember that day, the day the quake hit. I don't remember the day the disaster became the new normal. Like San Francisco across the bay, the city of Oakland would never be the same. When the Hayward fault threw a tantrum, the whole liquefaction zone briefly liquefied (hence the name), and the buildings stupid humans had stuck on top of that gnarly mess of landfill and wishful thinking slid over, fell down, and fell apart.

I didn't leave Oakland for a week. Ange and I had just landed at Oakland airport after a week-long camping trip in the Nevada desert, a little pre-Burning Man event. We'd gone down to Nevada with full packs and come back with them nearly as full — the people who lived close enough to drive in had much better chow than the dried hippie treats we'd made, and they'd been cool about sharing. So when the Seneca quake hit, we dusted ourselves off and did what you do: we went to see how we could help.



It was harder than it sounds. Without working phones, there wasn't any way to look at Twitter and read about what was going on out of our lines of sight. But we let the sounds and the movement of other people be our guides, and it wasn't long before we were in the rubble of a housing project, digging alongside cops, fire fighters, neighbors...anyone who could make it. Everyone had stories about things they'd seen: fires, gas leaks, downed electrical cables. We absorbed each bit of terrible news numbly. The same numbness descended on me when I helped a woman move a broken piece of roofing and found her daughter underneath, bloody and unconscious. The first-aid training I'd had kicked in, and I did what I

could for her until a real medic arrived, which might have been twenty minutes or two minutes or two hours. The girl's blood was still on my clothes a week later when I got home to Potrero Hill in San Francisco, on the other side of the bay. In the meantime, Ange and I slept in our tent, ate our rations and whatever we were given at the tables set up by different groups — sometimes church groups, sometimes Occupy Oakland, sometimes FEMA. We never saw the Red Cross, though they raised a buttload of money for “Oakland relief.”

Our phones started working the first night, and we called home and spoke to our parents. They were half-insane with panic: they knew our plane had landed, but hadn't heard anything else. They wanted us to get home right away, of course, but the routes back into the city were all jammed solid, the ferries filled to capacity. We convinced them that we were in the right place, though in my case I had to remind my parents more than once that at nineteen I was a grownup, and old enough to make my own decisions.

But by day seven, I got up and realized that I'd had a hot shower in a friendly stranger's house, had made my coffee with water boiled from a working electrical outlet, had checked my email on my working phone, and I looked at Ange and she looked at me and we both said, “Time to go.” We found the people we'd worked with, traded phone numbers and email addresses and long hugs, cried a little, and got on a ferry home.

When we got to Fisherman's Wharf we stopped in our tracks. “I don't want to go,” I said. For more than a week, I hadn't been out of earshot of Ange. We'd fought, we'd sweated, we'd rubbed each others' sore muscles and bandaged each other's blisters. Without working network connections, we hadn't even had that companionable together-but-apart experience of sitting together but

being in your own Internet world, prodding at your phone. We'd just been *there* and *together*.

"Don't be ridiculous," she said, but she was crying a bit. "We'll see each other again tomorrow morning, doofus. I live two miles from your house."

She was right, but as soon as she was out of sight, fear started to gnaw at my guts. That's the one emotion I *hadn't* felt during the week in Oakland: fear. I'd felt brief terror when the bus started to roll, and revulsion, and sorrow, and exhaustion, but I'd developed a kind of blank no-space where my fear should have been. Now the space filled up, and fast. Ange was out of sight. Anything could happen. As I descended the BART stairs, the walls and roof loomed over me, and I flashed on all the tons of concrete and plaster and wood and dirt I'd shifted, and imagined what it would be like if those walls were to come down on me.

I didn't make it to the platform. By the time I got to the final escalator, I was in full panic attack, breathing heavily, clutching my chest, shaking. A young black guy behind me caught sight of me and said, "Woah, you okay?" I tried to say *Yeah, it's nothing*, but I couldn't choke out any words. There was no air in my lungs for speech. I never learned that guy's name, but he led me by the elbow back toward the turnstiles, and stood with me while I tried to breathe.

"Were you in the quake?" he said.

I nodded. I wanted to say, "It's not like that, I was a helper, not one of the victims," but hey, no air.

"That's cool," he said. "Going down there after something like that, well...I wasn't even in town that day and I can barely bring myself to do it, you know? I mean, look at that crack on the wall —" He pointed. I hadn't noticed it. It was like a zigzag of lightning forking down from the ceiling to the floor, radiating out from

there. The wall had been shifted, along with the rest of town, by Seneca, but had remained standing...for now. It suddenly got a hundred times harder to breathe. “Whoops, sorry! Do you want to get out of here?”

I nodded and gulped air like a fish out of water. He let me lean on him while we went to the turnstiles, and he left me leaning on one while he spoke to the station guard, who took one look at me and buzzed us both through. He got me back up to the surface and I could breathe again.

“Thanks,” I said. “Thanks a *lot*.” I swallowed a couple of times, wiped at the sweat on my face. I’d been sweating over shovels and pry-bars all week with a bandanna over my face, but this was different. It was cold terror sweat, slimy and shameful. “Sorry,” I said, and found that I was on the verge of tears. Jesus, I was a basket case.

“Nothing to be sorry about,” he said. He sounded sincere. I guess he was. He sat next to me for a while. He was dressed like someone with a job to go to, good shoes and pants with a crease down the leg, but he sat with me for a while.

“Thanks,” I said, finally.

“You’re all right,” he said, and I wasn’t sure if it was a question or a diagnosis.

“I’m all right,” I said, because agreeing was easier than disagreeing. I don’t know if I said thank you again, or what, but the next thing I knew I was walking up Stockton Street, up and up that steep hill, over the summit, and down through Chinatown toward Market Street. I was dusty and dirty and sweaty and tired when I got home, but I was also comfortably numb, which was good, because *someone* had to be calm and collected, and it wasn’t my parents, who were totally freaked out at yet another incident in which I found myself in the middle of some kind of horrible problem, incommunicado and in the line of fire. Mom

and Dad finally stopped hugging me and Dad made a ha-ha-only-serious joke about once being an accident, twice a coincidence, and three times a habit, and they let me go to bed.

As my head hit the pillow, I would have bet a billion dollars that I was going to sleep for eighteen hours and then wake up, eat breakfast and go back to bed for another eighteen. But when I jolted awake, covered in nightmare sweat, the numbers on my homemade nixie-tube clock swore that it was 4:12 a.m. I tried to go back to sleep, even tried my mom's trick of putting on the BBC's shipping news — a droning readout of weather conditions in distant places, which could knock her out like a hammer — but I was wide awake, with a totally undeserved three-espresso jitter.

I had a quick shower and brushed my teeth, then took my beard-trimmer to my face and hair, reducing everything to the number-three fuzz I'd been wearing all summer, but which had grown out into an irritating length - hair long enough to tangle, enough beard to catch stray bits of food and to itch my face like a brillo pad. Then I padded downstairs in a pair of boxer shorts and raided the kitchen, putting away a half-pound of granola with whatever nuts and dried fruits I could find on top. I had it with Dad's homemade yogurt, and it was the pure taste of home, the flavor of a hundred late-night snacks wolfed down after nights spent partying or hacking. As I put the bowl in the dishwasher, I was struck by a terrible urge to throw it against the wall. It was all too damned *normal*. I'd been a human digging machine for a week, and now here I was, everything same as it ever was. There were still people in Oakland who were in deep trouble — people who'd lost a lot more than the few damaged pictures and knickknacks that were sitting on our kitchen table, awaiting mending. While I'd been in Oakland, I'd been part of something bigger: I'd been helping people, and they'd been helping

me. It was weird, because for all that it was a horrific disaster, it was also the chance to live like it was the first days of a better nation, a place where every person you met was your brother or sister, where you did what needed doing because it needed doing.

All my life, I'd been looking for something bigger than me, something I could be a part of. Once, I'd accidentally started a guerrilla army that kicked the DHS out of San Francisco. Once, I'd helped put a bunch of secrets where they needed to go. Both of those things had been complicated, and hard, and they'd left me feeling like I still hadn't found whatever it was that was the whole point of living.

But standing with my neighbors, day and night, moving big lumps of rock and wood and dirt from where it was to where it needed to be — that had been *simple*. Never *easy*, of course. But simple. Doing what needed doing.

That's what had gotten me up at 4:12 a.m. The knowledge that there was work to be done, and that I hadn't been doing it.

It was time to get back to work.



It turns out that being semi-employed had one serious advantage: I didn't need to hit up my boss for time off. All I needed to do was stop scrounging around the startups I knew — looking for a couple days' work writing unit tests or ramming mountains of analytic data in and out of hadoop to figure out, to the pixel, where every button on a web-page should live — and I was at liberty. Ever since I'd dropped out of university, I'd been saving ten percent of every paycheck in a rainy-day fund, doing everything I could to forget it was there. It seemed no one I knew had a steady job anymore. If I had one penny left over at the end of the

day, I should be socking it away against the day when there wasn't any money to be had.

Well, the rains had come. Literally. Eight days after Seneca, the rains started. Record storms, the kind that end with flash floods and mudslides even in the good times. These weren't good times. Parts of San Francisco and Berkeley were still boarded up and rebuilding, and Oakland, well, Oakland was Oakland. Slammed by the quake, drowned by the flood, and the part of the Bay Area where there was the least money for seismic retrofits: the earth was angry with the East Bay for sure.

I'd gotten into the habit of making my parents coffee in the morning, at least on the days when I got up earlier than them. I couldn't bear to watch them drink the swill they brewed themselves. The morning I headed out to report to Occupy Seneca, I made it as extra-special perfect as I could. The rain drummed on the windows and the wind lashed the tree-branches, and we sipped our coffee. Sitting by the front door were my raincoat, my pack in its rain-cover, my rain boots, and a waterproof sailor hat. Dad gave me that one, something he'd been given as a joke by his students a million years before. It was a cheerful yellow sou'wester and it made me look like I should be on a package of frozen fish-fingers. It was also amazing at keeping my head dry, because, you know, sailors.

Ange came in halfway through our second cup, looking crazy adorbs in her slicker and boots. I grinned like a fool as I answered the door and she gave me a drippy kiss that left me with second-hand raindrops all down my front. "Do you like it?" she said, twirling in the front hall. "I feel like a drowned hobbit."

"It works for you," I said. "Come in and get fuelled up."

Dirty secret: if they had to choose between me and Ange, I think my parents would choose Ange. Not in a creepy way or anything — they loved me and everything. But Ange was the clear favorite in the household. The parental units lit up like Christmas lights as she came into the kitchen, fussed over her with tea-towels, offered her breakfast. She grinned at me and stuck her tongue out, because she'd heard my theories on my parents' relative affection for us before, and she always made the most of it when they made a big deal of her.

Two cups of coffee later, I managed to pry her loose from my parents' grasp. We suited up and set out, me riding behind her, our bikes throwing up fantails of water as we splashed up and down Potrero Hill toward the ferry docks. I knew to the stroke how much pedalling we had to do to make it up and over, and where the shallowest approaches were, but even so, we were both puffed out and red-faced by the time we boarded the ferry. But even after I caught my breath, I found my heart was still thudding in my chest. It was a good feeling, like the feeling I got just before I first kissed Ange, when I knew what was coming, but still couldn't believe it.

Ange's fingers twined with mine. "Here we go," she said. We kissed again through the curtain of rain pouring down of the brim of my hat and her hood.

"Back to work," I said, and we squeezed. The ferry bumped away from the pier.



It had only been a few days since we'd last been to Oakland, but things had sure changed in the interim. The worst-hit sites were now partitioned off with hurricane fencing bearing day-glo orange WARNING ribbons. When we'd left there'd been ad-hoc tables and tents with a mix of medics, chowlines, and

all-purpose chill-out zones where there was WiFi, power outlets, and a mixture of donated clothes, toys, and furniture. Now there were two camps, and they couldn't have been more different.

On one side, in what had once been a parkette between two tall housing projects, there was the FEMA camp, where shuffling lines of people queued for hours to talk to various people sitting behind desks in smart, official-looking tents. On the other side, where there had once been a couple of basketball courts, was the Occupy Seneca operation, which was a lot less, um, official. Instead of burly guys in matching raincoats with FEMA and OPD in big reflective sans-serif letters on the back, the Occupy side was a patchwork quilt of people in outdoorsy high-tech nylon stuff, Army surplus ponchos, improvised rainwear made out of heavy nylon shopping bags, and a guy in a huge, trailing coat that seemed to have been improvised from part of a giant, screen-printed vinyl advertisement — maybe a billboard or a banner that had come down with the quake. All the colors of the rainbow were there, but they were all desaturated and waterlogged by the driving rain. They were working out of a set of yurts, camping tents, jerry-rigged shelters, and lean-tos. Kids ran around between these shelters, not caring about the mud splattering up their legs and covering them to the waists. It was warmer on this side of the bay, the kind of freak weather we'd been getting more and more frequently. With the rain and the mud, it gave the whole thing the feeling of a jungle.

We waded into the Occupy camp. An older African American woman, maybe my mother's age, smiled and said hello.

"Hi there," I said. "Um, we wanted to help out, okay?" I felt weirdly tongue-tied. When we'd gone from the airport shuttle-bus to the wreckages, we'd been doing

what needed to be done. Now it felt like we'd come from Away to Provide Aid, which was a bit weird, even though Away in this case was just across the Bay.

"My name's Esther," the woman said. "What's yours?"

Ange stuck her hand out. "Ange," she said. "And Marcus." She pointed at me. We shook all round, solemnly.

Esther looked us up and down. "All right," she said. "what can you do?"

I opened my mouth, and then closed it. What could I do? Whatever it took, right? That's what I'd been doing in that long-ago time, a couple days back.

"We were coming in from Oakland Airport when Seneca hit. We spent a week digging and helping out on this side, then went home to San Francisco a couple days ago to see our folks and rest up. Now we're back to help out however we can." If I'd said it, it would have sounded all defensive and boastful, but when Ange said it, it just sounded like a statement of fact. I was a lucky, lucky guy.

Esther nodded. "Not much of that now, thankfully. Everyone's accounted for, one way or another, and now that they're here, we can't even go into our homes to get our things." She cut her eyes toward the FEMA camp and gave a minute shake of her head. "But that was the easy part, as I'm sure you understand. Now we're figuring out where everyone's going to live, what they're going to eat, where they're going to go to school —" She waved her hands at the tents. "The real work. The hard work."

I opened my mouth and closed it again. I hadn't really thought this far. What would you do after the digging in the rubble part was over? I felt remarkably useless. I wasn't a carpenter. I couldn't build a house. I wasn't a lawyer, I couldn't sue to make the City of Oakland provide housing. I wasn't a teacher, I couldn't

run a classroom for these kids. What was I really *good* for, when it was all said and done?

Ange, though, didn't seem to share my anxiety. "We're here to work with you however we can. We're all in this together, right? Neither of us have a job. Neither of us can afford a place to live. We're one earthquake away from living in a tent. So what do we do to start doing something?"

Esther grinned and clapped. "I could hug you. 'What do we do to start doing something?' That's the question, isn't it? Let's see what we can find for you."

Thus began the second phase of our lives in Oakland after Seneca: I washed dishes and then I carried the dishwater a whole block to the nearest working sewer. I helped organize piles of donated furniture and clothes. I rehabilitated a hexayurt made from chipboard that had been assembled and disassembled so many times that it had gone crumbly around the edges and needed to be reinforced with strips of 1x4 lumber I cut with a handsaw, giving myself a nasty scratch or two. One of the medics checked me out and made me text my mom and make sure my tetanus shot was up to date.

Then someone stuck a duct-taped laptop in front of me and told me to start going through a bunch of random files where people had listed clothes and furniture needs, descriptions of lost heirlooms, offers of places to sleep, offers of donated labor, and a million other details, and asked me if I could make sense of them. Four hours later, I was reinstalling the laptop's crashy operating system, and that was probably the moment that cemented my destiny as Occupy Seneca's IT drone.



Here's where the movie of my life will feature a montage of me fixing computers, making the WiFi work, putting together a simple database program where all the different needs and offers could be listed. A woman from Craigslist emailed me and offered to set up an interchange so that people could post offers and requests to either the Occupy Seneca site or Craigslist's Seneca forum and the two would synch up automatically, so I spent a couple days getting that to work.

Once word got around that there was someone at Occupy Seneca who'd get old computers running again and find them a good home, the semi-busted machines came out by the dumpsterload. It got so that I had to recruit a couple more volunteers to help with the work, and one of them, Kadisha, had the excellent idea of immediately wiping the hard-drives of any machines that came in, because *none* of us wanted to be responsible for whatever data people stupidly entrusted to us. Weirdly, that got us mentioned on a bunch of cable news shows and went national, and the next thing we knew, we were practically drowning in PCs. Luckily we also got tons of volunteers who were willing to put them together, too, and before long, a whole section of Occupy Seneca was just devoted to teaching people to put together their own computers or picking up computers someone else had put together. Pretty much anyone who wanted a computer could get one just by walking in and taking one off a stack. Some of the kids I had working with me were crazy about it, tried to see how many machines they could do in a day. One guy, Thien, managed 21 working, tested machines in one day, working on them in batches of seven. By the last batch, we'd all stopped work to watch him dash from one machine to the next, swapping in parts from huge plastic tubs full of stuff he'd looted from unsalvageable machines. When he finished, we cheered loud enough to bring the whole camp running, to find Occupy's nerd squad surrounding Thien's prone form, fanning him with hankies

and bandannas and plying him with my special brew coffee: dark and fragrant as licorice.

Why all the PCs? Because they were the lifeblood of Occupy Seneca. A couple years before, Occupy had been a place: a camp with a bunch of tents where people drummed and protested and, well, hung out.

Occupy Seneca was an *activity*. We weren't there for disaster relief. We were there for *mutual aid*, like it said on the banners and t-shirts and stenciled on the PCs we built. Some of us had jobs. Some of us didn't. Some of us were homeless because we'd lost our houses to Seneca. Some of us were homeless because we were homeless. Some of us weren't homeless. Some of us were on drugs. Some of us were straightedge. What had started as a weird mix of crustypunks, project kids, sixties throwbacks and random junkies had turned into something more like a cross-section of Bay Area humanity, like someone took an N-Judah car at rush-hour and upended it at a semi-random, semi-destroyed spot in Oakland.

The thing that bound us all together was the realization that taking care of each other kicked ass. Seneca had knocked a ton of local businesses flat, literally and figuratively, and it had left plenty of people without schools, homes and jobs. But that was just an accelerated version of what had been happening to this part of the east bay — and across America — for years. Pretty much everyone I knew was either out of work or only half-employed, from my parents to all the kids I went to school with.

But we were *Americans*. By global standards we were rich. Not with money, but with stuff. The economy had tanked, the spreadsheets said that there was no more value left, no reason to put people to work making things and selling thing because no one wanted to buy them because no one was being put to work

making things and selling things. Lather, rinse, repeat. But everyone I knew wanted to work, and everyone I knew wanted to buy stuff, and so clearly it was time to stop listening to the spreadsheets.

Instead, we listened to the database. While the politicians were pounding the podium about finding housing for Seneca's victims, we were taking a page from AirBnB's book and building tools to help people find neighbors who could take them in. We even found people — qualified teachers! — who wanted come down and give lessons to kids whose schools had been shut due to structural damage and hadn't been assigned a new school yet. I'd grown up with online communities, places where the conversation was great but you never got to meet the people you were talking to. And I'd grown up with real-world communities, the people around me, my neighbors, friends and family. But with Occupy Seneca, it felt like we'd finally married them. When online discussions got too heated, someone would always suggest meeting up on one of the sofas at Occupy and talking it out face to face. When face to face discussions seemed to be going in circles, we'd take them online. It was the best of both world. Maybe the best of all worlds.

So, of course, it wouldn't and couldn't last.



Afterward, the Oakland PD swore that they'd given notice to vacate, "working peaceably with the Occupy Seneca leadership to ensure a smooth transition." Only one problem: we didn't have leaders, we had online forums, and no one ever from Oakland PD ever posted there openly. Maybe they had undercovers on the message boards. It was pretty obvious, later on, that they'd had them in the camp, probably from the start.

Also, “a smooth transition?” To what? After the midnight bullhorns and the shouts and barked orders, they threw up a fence around Occupy Seneca, a fence with a gate that admitted a bulldozer that smashed the whole thing in ten seconds flat. Yes, flat. Our gaily decorated tent-city, with its donated porta-sans, its computer workshops, its meeting areas and shades and kitchens and safe spaces — all of it pancaked in an eyeblink, shoved rudely into a giant, undifferentiated pile of belongings and projects and work and love that was now just junk. Maybe that’s what they meant by a “smooth” transition, because when it was over, the ground certainly was smooth. They’d turned our camp into a “smooth transition” to precisely nothing

Some people refused to budge when the cops announced that we had five minutes to vacate. Those people went to jail. The rest of us — a skeleton crew of people who were spending the night in the camp, maybe a tenth of the people you’d find at morning rush-hour, when everyone came by for hot breakfasts and my totally, utterly amazing coffee — stood miserably in the ruddy dawn and watched them destroy everything we cared about and worked for in less time than it takes to describe it. Then we watched the cars with our friends in them drive away to jail. Then we raised bail and called lawyers and uploaded videos and made as big a stink as we could.

Everyone was suitably outraged, of course, but not enough to, you know, do anything about it. We kept things going as much as we could: after all, we *were* online, so who needed to actually physically see each other anyway?

Us, as it turned out. So much of what had made Occupy Seneca work was in the place. A place where we could meet, where kids could be brought for classes. Where we could look each other in the eyeballs and solve our differences. A place where you could get a free computer, or learn to build a computer out of garbage.

A place to keep garbage from which to build computers, along with a million other kinds of donated stuff that was carefully cataloged and available to anyone rebuilding their lives to get along.

Occupy Seneca had been the physical embodiment of mutual aid. It didn't matter if the disaster that clobbered you was an earthquake, the economy, your deadbeat ex-husband, or something weird with your own brain chemistry, we were all there to help each other get through it all. When I told my parents about it, my Mom told me it reminded her of the stories her own mum had told her about living through the Blitz in London, everyone helping everyone else get on with things. Mom and Dad had even been down a couple times, and they'd helped cook meals and then hung out in the evening to talk with the rest of the Occupiers until late.

We'd felt so *resilient*, but losing our place smashed us flat. *Goddamn* them, why? All we were doing was helping.



It didn't take long to learn exactly how and why Occupy Seneca got "smoothly transitioned." Say what you will about the City of Oakland, it leaked like a sieve. Less than two days after the eviction, I was just about to head out to a contract job when my phone went crazy with DMs on Twitter. I checked in and saw that half the world wanted me to look at a paste-dump from one of the Anon factions: correspondence between various levels of Oakland city government, FEMA, and Oakland PD, the upshot of which was that a private contractor had successfully bid on the megacontract to begin a "renew and rebuild" project for Oakland. A separate thread suggested that the total value of the bid might run to the *billions*, if they met all their milestones and leveled up by winning the bids to knock down

and rebuild all the housing projects that had been damaged by Seneca. Somehow, there was plenty of money for that. Then there was the smoking gun: a three-way round-robin between the city manager's office, Oakland PD, and the contractor's PR people, about how much of an eyesore Occupy Seneca was, and how getting us out of there before we became a "permanent, established presence" was a "top priority."

My first reaction wasn't anger. It was, "When the hell are these idiots going to start encrypting their email?" I mean, seriously. Here we were, living in the age of the leak, a time when even the goddamned Director of the CIA gets his email splashed all over the newspaper, and these dorks couldn't be bothered to download a copy of GNU Privacy Guard and generate a keypair. Of course, they'd probably pick "password123!" as their passphrase, so whatever.

But that was only reflex, the reaction I *always* got when I heard about what a total derpfest computers were for the people who were supposedly in charge of the whole show. It passed quickly, and left behind a kind of cold fury. They'd destroyed everything we'd built, the thing that had given us hope, because they didn't like the appearance of a disorganized camp of people helping each other out.

The thing became actual news a couple of hours later, when the same cable news show that had covered our little build-a-PC project called me up and asked me if I'd come down and talk about what had become of it all. I said yes, though I hated doing this sort of thing, and then they announced that they wanted me at their studio downtown in, like, fifteen minutes. It was one of those rent-a-studio places with a bunch of small, spotlit black rooms with a camera and a monitor and an engineer, where you'd go and sit on a stool and talk back to a face on a screen, some cable newsdroid in a distant city like Atlanta or New York. I'd done

it twice before and both times it had felt absolutely and totally weird. There was a little table with a vanity mirror and a spotlight and half-dried-up pots of makeup and concealer, but no makeup artist. So apparently there was a sort of person for whom this was all normal, someone who'd just show up in a black box, apply makeup, and then talk to a mystery face on a screen as naturally as you'd talk to someone over the breakfast table. I wasn't that kind of person. I couldn't even imagine being that kind of person.

They'd had me rush like a crazy person to the studio, but once I got there, I had to wait in that weird black room for two and a half hours, because other stuff that was more important kept coming up and they couldn't spare a news anchor to interview me. I'd planned on this, based on past experience, so I had my laptop with me, and I was *just* able to get Internet through my phone, so I tethered up and read the Occupy forums in slow motion. I kept getting fed up with the drip-feed network access and I'd close the lid and just sit there for a while, until I got bored enough that experimenting with the makeup started to seem like a good idea, then I'd get back to the net. Eventually the voice in my headphone said, "Marcus, they're ready for you now," and I found myself suddenly, inexplicably in tears. They welled up without warning, and I swallowed hard three times, swiped at my face savagely with the back of my hand, and told the nice newsdroid about what they'd done to the place I loved, trying my best to pretend that there weren't tears slipping silently down my face while I spoke.

I got outside and wiped at my eyes over and over again until they stopped watering. I felt shaky as I walked down Market Street. I stopped in my tracks when I realized that my traitorous feet had walked me directly to the spot from which I had been kidnapped by the DHS after the bombing of the Bay Bridge. It

was a spot of power for me, the place where it had all started, the place where everything changed for me forever.

Of all the ways that my life changed that day, the most profound was the understanding that when things got too screwed up, I couldn't, shouldn't and wouldn't just suck it up or shrug it off. I would *do* something.



As usual, I was the last person to figure out what the rest of the world had already realized. Occupy Seneca was worth fighting for. By the time I checked my phone and got back on the feeds, it was already full of pictures of the crowds massing at the site of the former Occupy camp. I called Ange and got sent straight to voicemail, four times in a row. I sent a text and it bounced. Sent an email, and my heart thudded. Ange would have seen this kicking off, would have tried to call me while I was out, gotten sent straight to voicemail after I parked my phone to keep it from b0rking the studio gear. And she would have headed straight over, figuring correctly that I was a big boy and would see what was going on and get there when I could. Which meant I needed to get back to the ferry docks, right now. I spun around, stuck my phone in my pocket, and starting jog-walking toward Embarcadero. After five minutes, I started to run.

I wasn't the only one who'd gotten the word. By the time the ferry arrived, there were twenty or so of us in a little knot. Every time someone found something interesting — a video or a pic, a choice tweet — we'd all crowd in closer to watch. Just as the ferry pulled in and we shuffled onboard with the rest of the crowd, I found a link to a live feed from a quadcopter over the scene. The angle was a familiar one to me. Even with all the dropouts and jitter, the video was riveting. There was the crowd, big, writhing, like the inside of a beehive or an

aerial view of a huge square dance, depending on your point of view and whether you thought of protests as joyous celebrations of free spirit or as mindless drones following all-powerful leaders.

Around the edges of the protest were dots with horizontal lines ahead of them. These were the Oakland PD, suited and booted in their riot gear, carrying their shields ahead of them. The drone video was sharp enough to pick out the baton each one carried, even on a little phone screen. These cops formed lines with buses behind them, unmoving and ruler-straight. The contrast couldn't have been sharper: the milling, organic, disorganized movements of the protesters, and the slashing lines of the cops.

Then something happened. It wasn't clear at the time, but when I watched it later, I could see where it started. A cop on the eastern perimeter stepped forward and slashed down with his baton. Down went a woman in a red head-kerchief, nothing else visible from the top-down view at first, then she was lying on the ground, and was a tangle of grey jeans and a white OAKLAND sweatshirt and white sneakers and brown skin.

Here's what you see next, if you advance the video one frame at a time. The woman — her name was Trisha Jackson, and she was an Honor Roll sophomore at McClymonds High, and this was her first demonstration — goes down. Four other protesters go to her aid, bringing her away from the cops. One of them, another woman, gestures at the cop, who stands motionless. There's sound, but it's undifferentiated, a kind of crowd noise mixed with the wind hitting the mic and the whir of the drone's propellers.

The cop continues to stand motionless. The camera is sharp enough to pick out the red stain spreading out on Trisha Jackson's OAKLAND sweatshirt, the red

blood staining the hands of the protesters who are trying to elevate her feet, turn her on her side into the recovery position, all the first aid stuff you learn in scouts or summer camp CPR.

Seen from overhead, the crowd seemed to ripple, like a wave had pushed through it. That was the general motion of people moving to see what the fuss was about. Many of them stopped around Trisha, forming a protective reef around her, and the remaining force of the wave was pushed around the reef, up toward the police. When I try to imagine what that looks like from the police's point of view, it's kind of scary. Imagine standing there, all armored up and armed to the teeth, facing thousands of people who are pissed as hell, and then, without any warning (at least if you missed the cop who lashed out at Trisha), they all start to push and shove and squirm toward you.

The police line rippled a couple of times, the cops all rocking their weight back into their back feet and then forward again, shifting to present their bodies side-on to the crowd, like fencers trying offer a smaller attack surface to their opponents. From above, the horizontal lines of the shields became diagonal slashes as they tightened the line. The crowd was still pushing around Trisha and her semicircular human shoal. Some of the people at the front of the wave were now practically on top of the police line, and, realizing this, they turned around and pushed backwards, against the tide of humanity. There's about ten frames of video when you can actually see the crowd responding to the push-back, leaning back the way they'd come like seaweed in a current. Everything gets very *compressed* as the push from the back and the lesser push from the front meet, and then, very quickly, the crowd boils toward the police line.

But the police line isn't a line anymore. It's broken into a hundred individual policemen, each one with shield and club, shuffle-stepping forward, viciously

pushing the protesters back toward the middle of the demonstration. When someone nearly tripped over the still-prone figure of Trisha Jackson, the people who'd been taking care of her seemed to look around and take stock of things, and a moment later she was up off the pavement, being held up above their heads crowd-surfing as the police pushed the line forward.

A few people couldn't get out of the way of the advancing police skirmish in time. These people took hard baton hits that left them curled up on the ground behind the advancing squadron, to be zip-tied in plastic cuffs and hauled off by more officers behind the skirmish line. But the majority of protesters crushed back, and now the police line on the opposite side of the protest was advancing, too, forcing the body of the protest back toward the first line. Caught between the two lines, protesters were beaten and trampled, panicked and stampeded. Then, because the chaos wasn't terrible enough, the police strapped on gas masks and a moment later, cannisters of tear-gas were lobbed into the crowd.

The first cannister caught a protester in the head and he went down like a sack of potatoes. Another protester, shirt pulled up over his face, bent down to drag the unconscious man away from the hissing, gassing cannister, but only made it five steps before collapsing in a coughing fit. A couple of times protesters caught up the cannisters and lobbed them back over the police lines. Most of the cannisters went straight into the crowd, though, and churned the existing chaos into full-blown panic. There was nowhere for the protesters to go now. The middle of the crowd was a hissing cauldron of toxic gas. The edges of the crowd were a vicious line of crashing batons wielded by masked and helmeted Oakland PD riot cops in full fury.

As we watched this from the ferry, we found ourselves shouting and moaning with the protesters. The phone's speaker was playing horrible screams now,

sounds that we could pick out over the other noises. They must have been loud. The sun was bright and hot, but the wind was cold, and it found its way into the gaps between my clothes, slithering over my skin and bringing up goose pimples. I was breathing hard through my nose, every breath a bouquet of salt air and diesel from the groaning ferry engines.

Ange was in that crowd.

The police lines continued to force their way in. This was a kettle, a compressed blocking-in of the protest, and as the lines tightened, we saw people slipping away at the gaps between them. Then the lines joined up and solidified. The kettle was complete. The protesters were fenced in. They didn't look like a square dance anymore. There wasn't enough room for that kind of random motion. Now they were crammed together so closely that no one could take more than half a step in any direction. The only breaks in the crowd were the injured and those who were caring for them.

Someone else had been reading tweets from those on the ground — the ones in the kettle and the ones who'd gotten away.

“The police are using a loudspeaker to tell them that they'll all be searched and have their IDs run before they're allowed to go.”

I groaned. I knew this drill. Every phone would be cloned, all the IDs run, and anyone with any prior offenses or outstanding warrants would be brought to jail. Technically, Ange had a prior offense — she'd been arrested by the DHS and held in their illegal camp on Treasure Island during the Xnet days. The prosecutor had dropped the charges eventually, but I was sure the OPD would still be able to find that arrest in their records. Who the hell knew what her sheet looked like? Maybe it just said “Arrested by federal agents for terrorism-related offenses” and

nothing else — nothing about how she'd been unconditionally discharged, and all the charges dropped. That'd be just great.

I'd been speed-dialling her over and over again through all of this, but she hadn't answered. Maybe her phone was broken, or out of battery, or smashed. Or maybe she was one of the unconscious ones. Or maybe she'd been arrested and her phone had been confiscated. If that's what it had come to, they were in for a surprise. Ange's phone would wipe itself after three unsuccessful password attempts, and its memory was encrypted. It was a standard Android build we'd cooked up at Occupy Seneca and helped everyone get running on their phones, except for the people who were stuck in Apple jail, with iPhones that were illegal to load your own software onto.

The ferry finished the crossing and the sailors did their thing with the ropes, tossing them and tying them off and all of that nautical stuff that so many of us had gotten used to while the Bay Bridge was being rebuilt. The gangplank crashed down with a clang that I felt through the soles of my boots. It was only then that I looked around. And froze.

There was a — a what, a squadron? A platoon? Something military, anyway — of armored Oakland PD riot cops standing at the end of the gangplank. They were shoulder to shoulder, visors down, batons in hand. The girl whose phone I'd been staring into, watching the drone feed, hit her video-camera button and swung the phone up to record the cops. A second later, there were dozens of cameras pointing at the officers.

Nobody moved to get off the boat. The cops hadn't told us we weren't allowed to, but they didn't need to. A baton in a gloved hand sends a powerful message.

I became aware of a voice behind me. “Excuse me. *Excuse me*. Excuse me.” It was an old woman, Chinese, pulling an old man along behind her by the hand. She gave me a prod in the ribs. “*Excuse me*.” She followed up by giving me a filthy look, the kind of look I usually give to dopes who stop at the tops of moving escalators while the people pile up behind them.

She took one look at the cops and clucked her tongue impatiently. “Well?” she said. “Come on, some of us have places to be. Out of the way.”

The riot visors were dark and reflected back most of the bright afternoon sunlight, but I swear I saw the front line of cops grin. I was grinning too. A second before, it felt like these guys were about to charge, batons high. Now they were visibly relaxing.

The cops shifted their weight back, then as a group shuffled backward to open up a space in their line. Now they almost looked like a hedge, or an honor guard. The old lady shuffled down the gangplank, dragging her husband, who’d started muttering irritably, and we followed them, along with the rest of the passengers. The phones were still rolling, still shooting video. A bunch of them would be streaming that video to safe online repositories so that it wouldn’t matter if someone seized the camera and erased its memory.

We set off for Occupy.



We couldn’t get very close. Long before we reached the horrible “smooth transition,” we knew from the tweets and the overhead feeds — there were six drones in the sky now, circling, plus all the news-drones that were going out to cable TV — that there was no way to reach the kettle. The cops had established a

kind of demilitarized zone between the rest of Oakland and the kettle. Only cops and emergency services types could get past the sawhorses and temporary fences.

But there was something else we knew before we got to the kettle: we'd become an army. Occupy Seneca had stood for more than a month, and we'd had thousands and thousands of visitors in that time. I didn't know how many, but one of the Occupy data scientists who hung out around the camp had ballparked it at about 40,000 people. There were at least that many in the streets that night, all headed for the kettle. The word of the demonstration had raced around the network of occupiers, supporters, rebuilders and well-wishers around Oakland and the whole Bay Area,.

We'd had experience with kettles in the Bay Area before, the big ones they'd thrown up around the debt-relief demonstrations at the Civic Center. The storm of bad publicity from those times still lingered, and no one at City Hall in San Francisco wanted to preside over any more kettles for the foreseeable future. But this was Oakland, which played by its own rules. Oakland was a city that had been at war with its police force since the previous century, and no one seemed to think that peace was coming anytime soon.

By the time we hit the police barricades, we were all tuned into Sukey, the mobile app that mapped kettles by taking in photos, tweets, texts, and other input from protesters on the ground and gave advice on how and where to escape them. The cool thing about Sukey was that it didn't require everyone to be tuned into it in order for it to work — so long as there was someone shouting "Go west, there's no cops that way," within earshot, the whole crowd could benefit from it.

Of course, Sukey was only as good as the input it got. The Sukey volunteers out on the wide Internet did their best to classify the stuff that came in from the

field, but sometimes it went a bit wrong — mostly in the form of false alarms. So every now and again, the rumors would race through the part of the crowd I was in, and we'd crush one way and then the other, trying to get away from a kettle that never appeared. Of course, it was possible that the reason the kettles never appeared is that whenever the cops moved to flank us, we changed shape so that they couldn't make it stick. No way to tell.

I've spent a lot of time in big crowds over the years, and on a tension scale of one to ten, this one was probably about an eight. The voices were tight and strained, and there was angry shouting now and again, especially from those right up against the barricades. Drones kept taking off and landing from the crowd as their tiny battery packs were drained dry and swapped out, and from them, we got a good look at the action inside the kettle. Things had gotten sweaty in there, with exhausted people sitting or lying around, crushed together with the wounded. People called out to the drones for water, but water is heavy ("a pint is a pound, the whole world 'round," as my mom said when she helped me with my science homework), and no one could figure out how to lift substantial amounts of liquid into the kettle, though there were people on both sides of the kettle who were amusing themselves by lifting in chewing gum, love-notes, copies of the Bill of Rights, Guy Fawkes masks, medical marijuana, non-medical marijuana, and misc. Lots of misc.

I would have been right there with them, field testing the lifting limits of a quadcopter and playing kettle absurdism, but I was half-frantic with worry about Ange. I'd already ducked calls from both my parents and her mom, because I didn't want to freak them out, and also because I didn't want to admit that if I couldn't make contact with Ange in that chaos was that she was hurt and/or busted.

I found myself pulling my phone out of my pocket every couple of seconds to scour the drone feeds and look for her face. Meanwhile, I'd be that guy standing at the top of a BART escalator, the people around me squashing to get past. This was stupid.

So I did what I should have done from the start. I found a curb to sit on a little way from the action, pulled out my laptop and tethered it to my phone, and used the crappy network connection to slurp up all the pics and videos that looked like they were being sent from inside the kettle. I ran every frame through a free photo-processing library that cut out anything that appeared to be a face, then fed that to a facial recognition program that checked to see if that face was anything like Ange's. It was very dirty programming, and used about a hundred times more resources on the virtual machines I was renting than it needed to. But that still only came out to a couple bucks' worth of compute time.

At first, the program wasn't finding anything. So I loosened up the parameters and got too much: manhole covers, car grilles, faces in posters and ads, anything remotely face-like. I played goldilocks with the face-chopping system until it was getting actual live human faces 95% of the time. Then I did the same thing with the recognizer until it was saving the faces of women who looked at least vaguely like Ange. (It helped that I had a huge library of pictures of Ange's face to use as a training set.) Thereafter, I sat on that curb and clicked through an endless stream of blurrycam pictures of women who looked vaguely like the love of my life, which was more than a little creepy.

But screw it. It was something, and something was better than nothing, at least right then. I click, click, clicked, hands shaking a little, trying not to think of what I'd do if I found Ange and she was one of the protesters stretched out on the ground. Hell, for that matter, what would I do if she was one of the protesters

walking around inside the kettle, locked up tight behind the police lines with no medical attention, no toilets, no water, no food and no shelter?

Click, click, click. Some of the faces were familiar because they really did look like Ange — the algorithm was moderately clever and good at its job — and some of them were familiar because they were women (and sometimes men — the algorithm wasn't that clever) I knew from the Occupy camp. None of them were Ange. Every now and again, my phone would buzz with a call from my parents or Ange's mom. Less often, a shadow would cross over my screen as someone tried to snoop on what I was doing, but I had one of those polarized plastic sheets over the screen, so anyone not looking straight on would only see blackness.

One of the shadows lingered and shifted, as its owner ostentatiously tried to find a viewing angle that would reveal my activity. I turned around, ready to say something sarcastic like, "Can I help you?" And there, standing above me, was.... Ange.

"You seem busy," she said.

I slammed my lid shut, clamped my laptop under my arm and leaped to my feet. "Ange!" I said, and grabbed her and squeezed her like a drowning man clutching a life preserver. She *oofed*, and squeezed me back, reaching up to get her arms around my neck.

We kissed. Kissed again. Would have kissed again, but my phone buzzed. It was Ange's mom. I answered it and passed the phone to Ange.

"Hi, Mom! Yeah. No, I'm okay. Okay. No, it's okay! My phone died. I don't know. I just found him. I don't know. I'll ask him. Maybe his phone wasn't working. Yes.

No. No, I'm fine. Jeez, no. No! Yes. Okay. I'll tell him. I'll ask him. Fine. Bye, Mom. Bye. *Bye!*"

She ended the call and handed me back my phone. "Why didn't you answer my mother's calls? Or your parents'?"

"I didn't know where you were," I said, my voice cracking a little. "I didn't want to worry them."

She swatted me upside the head. "Like not answering them wasn't going to worry them?"

I rubbed my ear. "Yeah, fine. Why weren't *you* answering?"

She held up her phone, which looked like it had been hit with a hammer. It wasn't just that the screen was cracked. Parts of it were actually missing, revealing the telltale green of printed circuit boards underneath, like glimpsing the intestines spilling out of a gut wound.

"Ouch," I said.

"I got stepped on," she said. "A lot." She hiked up her shirt and pulled her jeans down over her hip bone, showing me the bruises that marred her beautiful skin from ribs to tailbone. I noticed now what I'd missed in the first rush of overwhelming relief: she was a mess. Her makeup was smudged, and there were faded tear-tracks down her cheeks. Later, I'd find out that her right palm was skinned from wrist to fingers, the skin of her left knuckles abraded to match. As my mother would say, she looked like she'd been to the wars.

"Oh, Ange," I said, and squeezed her again.

"Oof," she said; then "Oh." She squeezed me back. "I've been looking for you. I knew you'd come. Been going crazy trying to find you."

“I’ve gone crazy,” I said.

“Uh-oh. What have you done, Marcus Yallow?”

I showed her.

“This —” she said. “This is —”

“Genius, right?”

“Creepy. But yeah, genius. Show me where you’re getting all these pics from?”



The kettle broke, eventually. Oakland PD played that game where they let some people dribble out after having their phones ghosted, kept others standing around in the heat of the afternoon and into the night, then took some of those away, and left others to go when they shut it all down. The protesters kept up their vigil until the last of the kettled had gone, but we left early. Ange put up a brave front, but she was in rough shape.

But that wasn’t the end of it. It was just the beginning. It’s funny — Occupy Seneca might have dribbled away on its own if they’d just let us be. People were finding houses, finding schools, getting their lives put back together. We were all in it together at Occupy, all living through our own slow-motion disasters, but the quake itself was the focus of it all. Once the worst of the visible damage had been repaired, the little bickers and ideological differences would have grown into big cracks, widened by the differences in class and race and ability and so on — all the stuff Americans were supposed to be blind to, and which always lurked underneath the bright, fragile surface, the bottomless, ancient depths.

The “smooth transition” gave us a new reason to go on. Whatever had brought us together, fighting for our survival kept us going.

The next demonstration was planned, not spontaneous. There were more silk-screened signs than handmade jobs made out of scraps of corrugated cardboard hand-lettered with sharpies. We had a permit from the City of Oakland, official “parade marshals” in reflective vests, and a real marching route and everything. In theory, it should have been a pleasant walk. There were kids out, old people, a large cadre of veterans in their uniforms — some of them young women and men in Afghanistan desert camou, more older ones in Vietnam greens and even some WWII and Korea uniforms. Some were in wheelchairs, and not just the old ones. There were a lot of Afghanistan- and Iraq-vintage vets missing arms. I’d heard about that. It was the kind of an injury you got if you had body armor and a helmet, but nothing protecting your arms. A generation before, they’d have come home in a body bag. Now they came home missing an arm. Or two.

As always, the numbers are in dispute. Organizers say x . Cops say $[x \text{ time } 0.5]$. Estimating crowds in an inexact science, of course — but not that inexact. There were at least twenty civilian drones doing flyovers during the march, and if you use a computer to estimate based on that footage, you get a number that’s a lot closer to x than one-half x . Call it 45,000 people. Or just call it a freaking *huge* number of people, if you prefer.

But the energy was...different. Something about being organized instead of spontaneous. It changes the nature of the crowd. Maybe it’s the knowing. When you just show up with a lot of people because something is just too screwed up *not* to show up, you can’t know where it’s going to end. When it’s planned in advance and there’s a route and a permit and marshals, you can be pretty sure

that when it's done, you'll just be going home, a little more footsore than you were when you started.

We marched. There were bands at intervals through the march, including the inevitable drum-circle types, but also a totally insane brass band whose horns were like a jazzed-out battle-cry; a samba squad; and a “band” whose instruments were hundreds of bells sewn onto their sleeves and pants-legs who jingled their way down the street, belting out a merry rhythm. A lot of the kids had painted faces — clown makeup, animal makeup. Some of the grownups, too. But it was missing something. That spark of anything-can-happen.

Until, that is, anything happened. If you watch it from the drone's-eye-view, which is the best way to watch stuff happen in a crowd, here's what you see: first the masks go on, some of them the traditional Black Bloc balaclavas, some of them Guy Fawkes masks, some just bandannas worn around the face like a cowboy movie bank robber. Five of the masked people put on reflective marshal vests, pull out reflective wands and begin to direct the mass of the demonstration down a side street, off the official route, and toward the site of the original Occupy camp, the one place we'd been sternly refused permission to march near.

About twenty percent of the demonstration had already gone past the detour, and it wasn't like everyone was going to follow a bunch of random dorks in face masks who were frantically waving them to turn, turn, turn here. But not everyone in a demonstration can see the marshals; sometimes you can only see the people who are around you or in front of you.

From the drone, you see the crowd milling and swirling at the detour, a confusion like leaves swirling around a drain. Then, a turning point: the brass

band, focused on their intense choreography and awesome jam, swung down the detour, the front row following the dancers ahead of them, who, in turn, were following a couple of masked types who were truly rocking out as they danced their way around the corner. Where the brass band went, others followed. Now the crowd was like a river diverted from its banks, carving a new path, and it seemed to suck up the parts of the march that had gone the “right” way on the official route. A few of the people closest to the detour doubled back and joined it, and then the people who were ahead of *them* doubled back, and soon the tide of people on the official route had reversed itself and was headed back to join up with the main body of the demonstration.

If you zoom up that aerial footage, you can see real marshals trying to get people back on track, especially the 20% advance guard that was being sucked back again. Some poor souls drifted from the official demonstration to the much larger one, got turned back, drifted back again, ended up lost, droplets thrown off by the river and beached. Here’s where it gets *really* interesting: for one reason or another, the marshals guiding that lost tribe on its safe, official route turned it back again, directed it to the breakaway. In other words, the fake, masked marshals had become the *de facto* official route-planners, and everyone else had to follow their lead.



“You see that?” Ange said, freezing the frame. We’d taken over the Turing room at the Noisebridge hackspace in San Francisco’s Mission District by degrees. We’d started off on a workbench, examining the video on my laptop, but we’d drawn a crowd, and someone had warmed up the projector and dragged up the chairs in the Turing room, and then someone else brought in one of the wireless

webcams so that people who heard that something interesting was happening at our hackerspace could tune in and watch. Then, inevitably, someone else brought in another projector and splashed the #noisebridge IRC channel on the wall, because what was the fun of watching if you couldn't join in, especially with quippy one-liners?

"Yeah," I said. "Why did they join in?" I shifted the ice-pack I was holding to my elbow. The cops hadn't liked the diverted demonstration route. Not one little bit. They hadn't been shy about expressing their disapproval, even with little kids and veterans and old people there. The National Lawyers Guild would be pulling shifts at the courthouse for days to get everyone bailed out. Luckily (?), Oakland PD's high spirits and freewheeling approach to due process meant that pretty much everyone would get out with suspended sentences or charges dropped altogether (there were probably several waiting to stand up in front of the judge who hadn't been charged with anything at all).

Ange shrugged. "There's only so much uncertainty and solitude anyone can bear, I guess. I mean, there's a point where, if you're in the demonstration, and the whole demonstration is over there, then you have to go over *there*, too."

"It's like liquid democracy," said one of the Noisebridge founders, a guy I didn't see very often around the place, because he spent most of his time on the road. The IRC filled up with chatter as people talked about whether this was an apt comparison or not. I tried to remember what liquid democracy was, then I just googled it on my phone and showed Ange my screen. We read the Wikipedia entry together.

Apparently, this was some kind voting system that the Pirate Party liked. It was supposed to be a sweet spot between representative democracy — where you

elected professional politicians who quit their day jobs and spent all their time debating the best way to do things and voting on them; and direct democracy, where everyone got polled on every issue, all the time, even when it was stuff they hadn't a clue about, like whether to give more funding to carbon nanotubes or use the money to fund Lyme disease research at Columbia. Neither of them was very good. The first one gave you professional politicians who spent more time keeping the people who funded their campaigns happy than they did voting for the programs that the voters needed. The second one turned every voter into a full-time maker-of-decisions about stuff that they often didn't care much about.

But liquid democracy supposedly solved this problem. For every and any issue, anyone could give her vote to some expert. So if there's someone you know who really understands urban cycling issues, you give your vote on cycling issues to her. And if there's some expert *she* trusts on the specifics of some particular cycling issue, she gets to delegate both your vote and hers, and so on. At any time, you can yank your vote from your delegate and vote it yourself, or redelegate it to someone else. It sounded complicated but I'd had plenty of crappy experiences with representative democracy — getting waterboarded isn't something I'd recommend — and I'd been around groups where *everything* got put to a vote until no everyone was ready to scream, so maybe this was a happy medium.

And it was right: this *was* like liquid democracy — the people around the edges delegated their vote on which way to go to the people who could see the marshals. The people who could see the marshals delegated their vote to the marshals. The marshals delegated their vote to the cops. When some of the group set off on its own path, the remainder pulled their votes and re-delegated them, and off they went.



It turned out that Ange had cracked a couple of ribs. They taped her up, but everything hurt — bending over, sitting up, carrying things, getting dressed. She got off easy. The kettle had hurt plenty of people, some of them badly. Getting caught in tear gas was bad. Getting hit by a tear gas canister at close range was worse. Not to mention that no one wanted to show up at a demonstration with a helmet or any other kind of armor, because the Alameda County District Attorney loved to add “conspiracy to riot” charges to the rap-sheet if you got arrested with any kind of protective gear, as though wearing a helmet was the same thing as carrying a baseball bat or a crowbar.

But funnily enough, it wasn't Ange that got scared. It was me. I was technically a convicted criminal, though my sentence had been suspended, and my lawyer from the XNet days had let me know that if I ever got arrested again, for anything, that sentence could be un-suspended. That meant that I could go to jail for doing something that would get the rest of my friends a slap on the wrist.

I could tell everyone that that was why I didn't want to go on demonstrations, why I didn't want to defend the place that we'd made and the thing that we'd built. But the truth was I was just plain scared. There was something about the idea of being caught in a kettle, stampeded and herded this way and that. Once I'd seen it from overhead, seen the casual brutality and the hopelessness of the people who were caught in the middle of it all... I'd just lost my nerve.

“Out with it,” Ange said. “Come on, enough. You've been lying around heaving sighs like an amateur production of *Hamlet* over there for the past two hours. Either tell me what's wrong or cut it out. But actually, tell me what's wrong. Come on, Marcus.”

I reached for the lamp, but Ange had unplugged it so that she could plug in a charger for a drone-battery. I grabbed my phone instead, which was charging off my laptop, which was plugged into the other outlet. I turned on the flashlight app and threw a dirty t-shirt over it to dim the light a little.

I sat up and looked at her. I'd had a crush on her since the night we'd met. Hell, I'd had a crush on her since the *minute* we'd met. We'd been through a lot together, and she was pretty much the only serious girlfriend I'd ever had, and vice-versa, and there was a part of me that was rational and said that it was basically impossible that I'd fall in love at first sight with the woman I was destined to spend my whole life with. I told that part to go die in a fire. This was Ange, and when I looked at her, I felt like I wanted to hug her, kiss her, jump on top of her, protect her, and cuddle her, all at once or in no particular order. Turning the lights on in a dark bedroom where she was lying next to me in was a kind of wonderful magic trick that never failed to lift my spirits.

Though in this case, my spirits were so low that they were merely lifted from the deepest catacombs to the depths of the lowest sub-basement.

"You look like you've been told you can't have a puppy for Christmas," she said.
"What the hell is going on?"

So I told her. "I know it's stupid. I wasn't even there. I was on the outside, where it was safe. You were in the middle of it all. You got hurt. But you still have the guts to keep on going out." I stopped. I was circling what I felt, but couldn't bulls-eye it. Sometimes, emotions just couldn't be reduced to words.

"You're afraid that they broke you. You're afraid that you'll always be afraid."

And sometimes, emotions can be reduced to words after all.

Which is not to say that it felt good to hear her say it. In fact, I shook my head and told her that wasn't it at all, even though she'd totally nailed me with a single shot. She did that cocked-eyebrow thing that let me know she had my number, then squeezed my hand and told me to go back to bed.

She is scarily good at figuring me out.



Of course, she hadn't dropped it. She just tabled it so that she could get a decent night's sleep. Come morning, while I puttered around her mother's kitchen making coffee for her, her mother, and her sister, she sat on the counter beside me, playing with her tablet, not saying a word, but letting me see that she hadn't forgotten our middle-of-the-night discussion.

Ange's mom had been one of those people who bought an overpriced "pod" espresso machine that used non-refillable sealed bullets of stale, pre-ground coffee to produce a sterile, messless, bitter and nearly undrinkable shot of espresso. She always made a point of telling me how great she thought it was and how she didn't understand what all the fuss was. Then I thrifted an Aeropress whose flange had cracked and fixed it up with some industrial adhesive, fixed the motor in a burned-out spice-grinder the same thrift shop was throwing out and brought it over to use as a grinder, then began to ruin her for lesser coffee, one cup at a time.

She still made the rotten pod stuff when I wasn't around, and she still made sarcastic noises when I pressed out a shot at topped it up with hot water, and she refused to let me explain the theory of coffee extraction at low temperatures, but damn, she drank the hell out of the coffee I made her.

I made her three cups before we ran out of beans, and all the while, Ange stood by me, tapping her tablet, letting the distinctive aural mix of protests, drone engines, wind in mics, and police megaphones provide a soundtrack to the morning.

Her sister peered over her shoulder for a bit while I washed up. “Look at that,” she said. “From this angle it looks so easy to get away. Maybe we should get everyone on the ground to watch this feed while the cops are trying to put ‘em in a kettle. They’d run circles around them.”

She seemed to picture it for a moment, then she laughed. “What a mess that’d be, though. Like a million idiots texting and walking at once. You get your feet stepped on and *then* you’d get kettled.”

Ange shut off the tablet and set out scrambled eggs for both of us. As usual, she made mine too spicy and made hers insane. But Ange’s spice addiction has its good points. All that hotness quickly obliterates any extraneous thoughts, focusing one hundred percent of your attention on the sensation that you’ve just swallowed a piranha made of live, white-hot coals, and it’s simultaneously chewing and barbecuing its way out of your guts.

But in a good way.

“Funny thing,” she said, looking down at her screen. “We get together at a protest because together, we’re stronger than we would be on our own. But once we’re all in one place, it’s so hard for us to move as a group that we’re easy pickings. We become more and less at the same times.”

“Superpowers are expensive,” I said.

“Now there’s an interesting thing for you to say,” she said. “Has my master plan to get you all hopped up on caffeine and spice-endorphins shaken something loose in that twisty little brain of yours?”

“Funny you should mention that,” I said. “It’s like there’s something good right there, just in the corner of my eye. Don’t want to look at it straight on, it’ll vanish.”

She held her palm out like she was luring a cat out from under a sofa. “Come on out little fella, we won’t hurt you.” She moved her hand so that she was cupping my chin, looking me straight in the eye. “Out with it, Yallow. Superpowers are expensive.”

I snorted. “Fine. Let’s see where this goes. What you can do, what I can do, what any of us can do on our own, that’s ‘human.’ There’s a good wide range in ‘human.’ You got your concert pianists at one end, people like me who can’t play chopsticks at the other end. But even the greatest pianist is less than an orchestra.”

“I don’t know if that’s true. I mean, what if the orchestra sucks?”

I clucked my tongue. “Say the whole orchestra is made up of the greatest musicians you can find. The world’s greatest piano player with the world’s greatest cellist and the world’s greatest triangle player and so on.”

“Okay, I’ve got you.”

“So the problem is that if you’re an awesome piano player, all it takes for you to make beautiful music is to sit down at a well-tuned keyboard and play. But if you’re playing with other people, you’ve got to, you know, pick a song, pick a key, pick a tempo. Spend a lot of time listening to the rest of the band and making sure everyone’s playing at the same time. But you do it, because playing six or

ten instruments at once, and doing a good job of it, that's more than one person can do."

"It's superhuman, in other words," Ange said.

"Exactly. So cooperating with other people gives you superhuman powers. Literally. But it costs something. Every moment you're spending checking your tempo or arguing about the piece or picking a key is a moment you're *not* spending playing music. That's the tax."

Ange nodded and opened up her tablet and stared at the screen again. "Look at this," she said, and pointed to the cops' rigid line. "These guys here, *they're* coordinated, and they don't need to stare at a phone screen the whole time to figure out where to stand or when to move. They just listen to the orders coming through their earpieces and do whatever their leaders tell them. That's the price of their superpowers: they have to shut up and do what someone else says. That's not a deal I'd want to take."

"Me neither," I said.



Which brings me to tonight. Or not quite.

It was later that day when Ange sat me down and gave me a little pep-talk about not being afraid, and if I *was* afraid, not being embarrassed by it. I told her it wasn't that easy and she countered that she'd never said it was *easy*, just that it was right. And then she said, "Look, Marcus, the problem is obvious. You've seen this all from the god's-eye view, you know how stupidly helpless we are when they bring on the kettle, and it's got you freaked out. No one likes to be outflanked, especially not when it's literal. Before, you fought back because you thought you

could win, but seen from the sky, it looks like you'll always lose, and it's cost you your nerve."

"You're not helping," I said.

"Shut up. The solution's easy, if only you'd stop moping. All you need to do figure out what will cure your feelings of helplessness and do that, and you won't be afraid anymore. Why don't you do some work on Sukey? It's totally aimed at solving this problem."

"It can't, though," I said. "For Sukey to work, you'd need to turn us into an army and let it play general. It sends us marching orders and we do maneuvers like cadets on drill parade. Forget it. Even if I wanted to take orders from someone, no one else would. And imagine what a nightmare it'd be if someone got into the command channel and sent everyone running right into the kettle. The security issues are brutal." The idea was right on the tip of my brain now, right there, and I wasn't going to let it slip away. I started to speak as fast as I could — pretty fast — not taking heed of the spit-flecks, determined to outrun my brain's own shyness and self-censorship: "What we need is, is, is —" It was gone. Back! "Remember the video of those masked people leading the demonstration back to Occupy? Remember the liquid democracy? If you are standing next to the person who knows which way to go, that person can just tell you about it. But if you're two or three of eleven people away, well, you might never find out. Or you might get stampeded. When I was outside the kettle, on the ferry, watching the drone footage, I could see how people were getting hurt, could see which way they should be running. If someone delegated their sense of direction to me, at just the right moment —"



So, tonight. Tonight I'm putting on a very special boot. It's the left boot from my roomiest pair: engineer boots I found at a stoop sale and was totally smitten by, even though I needed three pairs of my thickest socks to wear them without them slipping off. Tonight, though, it was a tight fit. It had a thick pad of piezoelectric crystal that turned every step I took into a bit of electricity that was used to trickle-charge a lithium cell we'd liberated from a junk mobile phone from the basket of donated electronics at Noisebridge. That was connected to a strip of velcro that wrapped around the thin, sensitive skin of my ankle, just where a particularly vindictive mosquito might bite you. That velcro, in turn, held a bunch of cannibalized cell-phone vibrators, four of them, at each of the cardinal points. There was a fifth lump, a little Bluetooth shield that connected to my phone, and that's where the fun started.

The funny thing about this kind of project is that if you can get other people excited about it, you can go very far, very fast. I posted about it on the Noisebridge mailing list on Saturday, and by Sunday night we'd banged together six rounds of prototype. It helped that there was already a commercial kit we could use for basics, a fun little gizmo that softly vibrated the side of your ankle that was closest to north, giving you a kind of innate, subliminal directional sense that was as different from looking at a compass as knowing a city was from looking at it on a map. The software was the tricky part, and that was mostly because we were all set on using Near Field Communications for delegation, and —

Wait, I'm getting ahead of myself.

Imagine that you're at some big demonstration and there's someone there, somewhere or other, who know where and how to move. Maybe they've got an earpiece screwed in and they're listening to someone who's watching a drone. Maybe they can see where the kettle ends. Maybe they just know something, or maybe they're watching a screen. Doesn't matter. The important thing is that this is someone you want to appoint as your personal guide.

That person is wearing an armband with a couple of identifiers: a QR code (so you can just snap a pic), a number (so you can tap it into your phone), and an arphid.

Yes, an arphid. My arch-nemesis. The ubiquitous radio-frequency ID tag, the snitch chip that beacons your location and identity to anyone with the cleverness to listen. What's more, *this* arphid is a Near-Field Communications chip, and NFC is doubly awful.

That's because the people who created the NFC drivers for Android phones were totally clueless on security. The standard NFC libraries are so badly written that all it takes to totally pwn an Android phone with NFC turned on is to simply brush past it with a loaded piece of paper bearing a gimmicked NFC sticker, and that phone will be yours forevermore — letting you watch out its camera, listen through its mic, sniff all the passwords entered on it, watch its GPS, slurp up all the files and personal pics in its memory, and that's just for starters.

So yeah, no one who knows anything likes NFC very much. But for our purposes, it was indispensable. We called the app "Hivemind," and it let a whole group of people move in superhuman synchrony without having to become obedient, militarized drones. Take a Hivemind-equipped phone, tell it who you wanted to delegate your navigation to — by touching them with the phone, scanning their QR code, or keying in their number — and your foot-powered anklet would

send you a continuous signal telling you where to go. We didn't need to outfit a whole protest to make this work, either. If there was someone visible to you who seemed to know where she was going, chances are, you'd follow.

Even if you weren't the following type, once a large portion of the group was in motion, heading the same way, chances were you wouldn't want to stand out there on your own, without the safety of the crowd. Yes, safety: a crowd that can't coordinate its movement is an easy target, while a crowd that has a grain or two of intelligence can move like gas flowing around obstacles, and be as hard to bottle up.

So we needed NFC, and we got it. The more paranoid among us used cheap second-hand Android phones, jailbroken and flashed with a secure fork of the operating system. There was nothing else important on those phones, and after the protest, they'd be re-flashed and restored to a known-good state. The rest of us just crossed our fingers and hoped that ParanoidAndroid's "secure" NFC drivers would be good enough to withstand any shenanigans in the crowd.

We'd tested the system by inserting two hundred people into the rush hour crowd around the Embarcadero, sprinting from one side of the terminal to the other for an hour. The aerial video was *amazing*. Our people were immediately apparent, but not because of how they dressed. Instead, you could tell who they were because they moved through the jammed mob like dolphins in a current. Only ten percent of us were loaded with Hivemind, but those twenty people were more than enough intelligence to turn us all into a superhuman organism. The best part was that you could follow anyone you chose, and change who you followed instantly. It was like being an army with no leaders — all the precision and coordination, none of the orders and ranks.

I've seen plenty of flashmobs, been in a few of them, but the point of those was always to be noticed, to stop people's busy lives for a timeout where something extraordinary happened. This time, our flashmob's extraordinary movement was so subtle and sly that no one but us was sure what was happening, and it wasn't until we regrouped that the miracle we'd just lived through hit home and we started to cheer spontaneously, cheer loud and long, that the rest of the world had any inkling that something out of the ordinary was taking place.



Tonight, we march on the site of Occupy Seneca and the smooth transition. That wasn't our idea. There have been demonstrations at Occupy every week since that Black Bloc operation. They'd been getting smaller each week, and we all knew that it was the death spiral for whatever we had there. Smaller numbers meant fewer press cameras, fewer "normal" people willing to come out with their kids or their grandmothers, until it was just street warriors and cops squaring off on a matter of principle, something that would always end with victory for the cops and beatings and jail for the demonstrators.

But tonight will be different. Tonight the hivemind will be inside the demonstration.



We stream in from many places, but we converge, as always, on the smooth transition. Many of us are carrying pots and pans, something we got from the Montreal student protests a few years back — the "casserole" protests that hit the street every night after Quebec's premier banned public marches, and people responded by walking and singing and banging on pots and pans.

We're young, mostly, though as always in the Bay Area there's a lot of aging hippies in their sixties and seventies salted in the crowd. Most of us are grim-faced, aware of the death spiral, with no idea of what else to do. But some of us — the hundred or so wearing Hivemind rigs, sending electricity into our batteries with every step, we're barely able to contain our excitement, and we're all grinning at one another like holy fools. We practically dance our way to the familiar police cordon around our paradise lost, the place where we started something extraordinary, now a blank slate, as though everything we did has been erased. It hasn't. The place wasn't the important thing. What we did there was the important thing, and what it did to us, that was the important thing, too. Like the Whos down in Whoville, we keep Christmas in our hearts, even after the grinchers at the OPD swipe all our stuff and run over it with a bulldozer.

I think that our joy can be felt even by the people who aren't in on the joke. I've been to plenty of marches since the smooth transition, and the sense that we were about to be stomped flat could be felt at every moment. Not tonight. Tonight, everyone has enough of a bounce in their step to power a city. Even before we turn it on, Hivemind is making a difference.

And there, at the end of the street, is the OPD line: sawhorses, temporary fences, and a bristling line of cops with helmets and shields and batons. Of course they knew we were coming. Even if you weren't monitoring our mailing lists and hashtags (they were) and even if you didn't have undercover agents burrowed into our group (they did), you can't really hide thousands of people moving through the streets of Oakland, carrying signs, singing, chanting.

These demonstrations are as formally ritualized as kabuki. The protesters come. They chant. They sing. They mass. The police order them to disperse. Some — more and more these days — obey the order. There's another police warning.

Then the kettle. They keep us penned in for long hours, punitively, caging us up in the rain or the cold or the heat, no toilets and no food, until they decide to let some of us go. The rest go to jail. And around we go again.

Not tonight!



When the second warning goes out, about two hundred of us take out our phones. As always happens around this time, the drones take to the sky. The aerostatic blimps are pretty good because their batteries last for ages, but only if the winds are kind to them. The quadcopters and little planes, those ones are the business, they can do airshow maneuvers, catching anything and everything with their night-vision cameras and beaming them back to the rest of the planet — anyone who cares to watch our own little Tahrir moment here in the East Bay. It's been over a year since any US police force used electromagnetic pulses against protesters' electronics — the collateral damage and the civil suits buried the SFPD when they last tried it — so the pilots have grown bold.

The firmware on those aircraft is amazing. I've written some barely functional software to keep a quadcopter flying, but the stuff they're using blows me away. I made a stone axe, they made a freakin' stealth bomber. These clever puppies know how to flock, how to avoid each other, how to find the action on the ground and home in on it for close-ups. The face-recog stuff I used when I was finding Ange? You could use it to tell the drones to find anyone and just follow that person around. Let me tell you, this is a weird experience, walking around with a quadcopter watchfully hanging over your shoulder. No wonder there's villages in Pakistan where people literally go insane from it all.

The police line bristles. They've finally started encrypting their communications, which is like, welcome to 1993, guys, but whatever. Nevertheless it means that we can't eavesdrop on the messages being whispered in the ear of those stony-faced guardians of public order facing us down, and they are all careful to maintain that pro-wrestler stare-down macho face, not twitching until the moment when they move. It's "discipline" — by which control freaks mean "pretending to be a robot" — and it's the price that OPD pays for its superpowers.

We've got new superpowers tonight — if they work.

It's been five minutes since the second warning. I've got a table showing the average — mean and median — time after a second warning and a kettle. Five minutes is stretching it. Any. Second. Now.

There. The police know how to do this. They've done it so many times before. The line moves. People too close to it get shoved, or, in the case of a cop who's really feeling his oats, a baton-strike. The line on the opposite side is moving, too. Cops on one side. Cops on the other. Fence on the third. Building on the fourth. The kettle's shrinking.

But there aren't enough OPD officers to encircle us. They have to squeeze us all into a space small enough to encompass with their bodies, first. From the sky, it's like two horizontal lines — the cookies in a huge Oreo — trying to squash a filling that's much wider than the biscuits. One of the biscuits is angling in, forming a kind of funnel that will eventually bend around to make a corral. From the sky, it's easy. They're going *this* way, so we go *that* way.

I've already spotted someone who's watching a phone and being led around by a seeing-eye person. I snap her QR code, and now my ankles are giving me a little bump of direction that's so subtle that I barely feel it. But I've practiced with it

and I just *know* that I need to go *thataway*, even though if you asked me to point to the spot on my ankle where the sensation is centered, I couldn't tell you. It's just a *knowing*, a compass sense, the way that a bird knows where north is, the way that you know where your hands are without having to look.

And then we *dance*.

When the police lines started moving, there were maybe 2,000 inside the tightening kettle. Hard to say. People in that sort of number are like gas molecules, the kind of thing you estimate, not the kind of thing you count.

But moments later, there were less than a hundred, exactly eighty-two, inside the kettle, and nearly 2,000 standing outside the police lines. Eighty-two is the kind of number you can easily count.

There's a moment of frozen time as the cops pause to listen to the voices in their ears, swivel their heads to look around. The protesters outside the kettle realize that they've been squirted out of their arbitrary detention like watermelon seeds slipping out of a fist.

About 200 of us know exactly how that happened. For everyone else, it's a small miracle on a cold night. There's a mist out now, hanging low to the ground, and it all seems a bit...magic.

When you see a magician pull off a wonderful trick, you applaud. We did. We beat our hands together until they were sore, dancing around while the police stood in their rigid lines.

What about the unlucky few caught in the kettle? They hardly seem to notice that they're prisoners. They're dancing too, and applauding with us, and then the police get some new order, and the straight lines move again, trying to reposition

themselves so that they're to either side of the main body of the protest once more. We let them do it, because it means our friends in the kettle get to go free.

But when the police move in to kettle us again, we repeat the magic trick. It's easier the second time around. We've had practice. This time, there's no one in the kettle when the lines close, and we're back where we started.

This time we don't dance, we *laugh*, because it is *hilarious*. It's like a Three Stooges routine, where the big tough guys keep grabbing the little guys, and the little guys keep escaping between their legs or through their arms. We've had two tries to practice our superhuman powers in a real field situation, and our back-channels are full of the home guard — people watching the drone feeds and watching the tweets and other updates — talking tactics and revising them in realtime. We don't need to hear what the cops' radios are saying, because we know what they're saying: "form a line, make a kettle." Keep doing the thing that didn't work in case it starts working.

It won't work, not ever again.

After a third dance, the drones' power is so low that we call it a night. The hivemind begins a triumphant march away from the site of the smooth transition, and the rest follow. Not because anyone forces them. Not because there's leaders. But because we're united, tonight.



Hivemind became big news in the days that followed. The overhead video — grainy and night-scoped as it was — was *spectacular* to watch. Even better than the crowd scenes in the Embarcadero. It's the epitome of the big, lumbering goofus trying to catch the quick and nimble trickster. The blogs, papers and even

TV were all over it. I got called up to do another satellite uplink, and this time it was in a little room where there were four other humans who were there to get me ready. They powdered me and put a little lavalier mic on my lapel and asked me a *lot* more questions, and then afterward they put on a “spokesman” for OPD in a crisp uniform who explained that police kettles were a matter of “public safety” and that anything that undermined the ability of police to round up nonviolent protesters and corral them for hours without basics like water, food and toilets was practically terrorism.

“But is it illegal?” the smooth talking head asked. I cheered in my little black room. That’s the question.

“Public safety is something we take very —”

“Are they breaking any laws, sir?”

“When you’re talking about large groups of people —”

“Which specific laws are they breaking?” Oh, she was *good*. He squirmed.

“I’m not here to talk about specific prosecutions —”

“I’m sorry, we’re out of time, thank you very much —”

I confess that I did a little victory dance on the spot.



Even better was when the reporters took us up on our invitation to come down to Noisebridge and actually meet the people who worked on Hivemind, instead of pretending that it was all my doing and that I spoke for everyone. We never called it a press conference and we refused to let them turn it into one. Instead, we ran it like an open house, and we had all kinds of projects going, the

laser-cutters whining and the 3D printers churning, and there were a million kinds of hackers doing a million kinds of projects. I think that a lot of the media had come down to find a secret group of semi-terrorists and we forced them to see us as we were: makers who cared about freedom.

Our back-channels — IRC, message boards, email lists, Twitter and Facebook updates — were full of speculation about what would happen *next* week when OPD had had some time to think about it, and while there was a lot of debate about whether they'd risk the lawsuits and pull out the electromagnetic guns and whether they'd arrest us on sight, we all agreed that the Hivemind we'd run was just the demo and now it was time to get to work turning it into something *real*.

We wikied up a huge wishlist of features for future versions and let the developers go to town. In theory, a super-elite OPD-DHS hacker could whip up a sly and malicious hunk of code that weakened our security without being obvious about it and check it into the codebase, then use it to start crashing Hivemind instances when the moment was at hand. But I thought it was more likely that the law enforcement presence lurking in our comms channels was there to figure out who to spy on and hassle at borders and build fat dossiers on.

I mean, maybe we could have tried to keep it all secret, but that was a high price to pay to be superhuman. Working together on this project gave us amazing super-powers, and whatever security we built into the system would be better even if the other side knew *exactly* what we were doing and how we were doing it.

Our best security was to be so wide open that everyone could help and everyone could check each other. A million free software projects have discovered that “if you build it, they will come” is a big fat lie most of the time, but in our case, they

did come. The world's hackerspaces and makerspaces had already thrown in their skills hacking on tools for the Arab Spring. That fire still burned around the world. From Hacker Dojo down the Peninsula to Hacklab in Toronto, the hackers of the world tweaked the code for Hivemind, tweaked our anklet design, and added more goodness to the drone autopilots and image-processing.

Ange was amazing at it. She hadn't been much of a coder when we met, but she was a natural, and always willing to learn. We were great together, working back-to-back, shouting at each other as we found bugs in each other's code. One night, we didn't even leave Noisebridge, just stayed up all night and then went back to my place and crashed out for five hours.

"We need a change of scenery," Ange said, as we washed each others' backs in the shower.

"Where to?"

"Let's visit Hacker Dojo," she said. So we packed a picnic basket and caught CalTrain down to Mountain View and met a bunch of people f2f whose code and messages we'd known intimately, but whose faces we'd never seen live. They shared our picnic and found bugs that we'd never have found on our own, because fresh eyeballs are made of awesome, and because my Ange is made of more awesome still.



It's amazing to think it's only been a week since Hivemind made its fantastic debut. Hard to believe that this crowd, these thronging thousands, heads high, a bounce in their steps, are what's become of the morose rump protest that had been present last week.

The OPD are waiting for us. They've tripled their numbers. They've put up a kind of cherry picker with armor around it, like a guard house in a POW movie. They've got water cannons. They've got gas.

We've got code, sensors, drones and an audience.

Even before we reach the police lines, the quadcopters are hovering along them, transmitting photos of any officer who has illegally removed his name badge. There's a group of volunteers who asked for this feature, and they're sitting at home with giant albums of OPD cops at previous demonstrations *with* their badges on, and they're using face-matching to put a name to the face. It's one thing to be anonymous when you're blowing the whistle on government wrongdoing, but a guy without a badge who hits you over the head with a club isn't a cop, he's a mugger.

These muggers-in-waiting have their own hashtag: #wheresyourbadge, and it's flooded with pictures and names. You can see it working because these nameless wonders start to thrash in their lines as someone in authority gets a phone call from the OPD's Internet team and then gets on the radio and says, "Johnson, where the hell is your name badge, goddammit?"

We cheer as the OPD chapter of Anonymous uncloaks and pastes its badges back on. The people who know what's going on cheer for that; the rest cheer for the sheer joy of a beautiful late afternoon and the wonder of a massive crowd that's bursting with confidence. Then the ones who know what's what clue the rest in and the cheers get louder.

The first skirmish comes right away, no warning this time. They're not in rigid lines anymore — they've apparently drilled in smaller squads that can break up and try to outmaneuver us. This probably sounded good in theory.

It's a total fail. We absorb the police units like amoebas surrounding their food, and then we poop 'em out again. The cops whirl to keep up with us and we dance with them like a do-se-do. Yee-haw!

The cops reform their lines and get ready for the next skirmish. It doesn't go any better. Neither does the next. We're all slightly breathless now, because we've been dancing like gooney birds for half an hour. We're all in shorts or jeans and tees. We're not allowed to wear armor. The cops, though, are wearing twenty pounds of nylon and metal and tactical everything, and they're sweating like pigs. Some of us had talked about bringing bottles of water to offer them, but figured they'd never accept them.



They're not going to dance with us all afternoon. It takes two heavy hoses and a full teargas charge, and more than half of us get away, but eventually they manage the kettle. But it's not the same kind of kettle, somehow.

For one thing, we know which cops to avoid. Another volunteer squad — back playing the home game — has been keeping track of which cops have been too macho to rotate off the line. Those are the timebomb cops, the cortisol-fuelled stressbunnies who are going to stand there, grinding their teeth, until it all gets to be too much and the baton comes out. Word gets around: stay clear of those cops.

We had 487 Hivemind rigs at the start of the day. Of those, 174 ended up inside the kettle, but half of those got watercannoned to death, so our intelligence is a little thin. On the other hand, that means there's more spare batteries to go around, and the folks on the outside are determined to make sure that we don't

have it too rough. A squadron of drones glide overhead, and in unison they drop small, cylindrical parcels with parachutes that snap open. Inside each insulated tube is a burrito and a bottle of water. The drones circle back and pick up more ammo, and soon there are burritos raining all around.

When the sun sets, I reach into the change pocket of my jeans for the thing I've been compulsively checking every five minutes. It's still there, right down at the bottom of the pocket where I'd shoved it. I hold it tight in my hand.

Ange is next to me, arm around my waist. She's holding the last bite of a burrito in her free hand.

"You know," she says, "we should rig up some kind of modified blood-sugar monitor for Hivemind, get it to measure cortisol levels, help figure out when you're about to go off the deep end. Like that guy —" she says, pointing to a guy who's getting really worked up, shouting at the cop line.

This is a very good idea, but I can barely take it in, because my blood is whooshing in my ears and my hands are shaking.

"Ange," I say, around my tongue, which is thick and dry. I swallow, but I can't swallow, and so I choke a little. I kneel.

I am on one knee.

"Ange," I say again, and she looks at me, and her eyes widen, because she always knows what I'm going to say before I say it.

"No *way!*" she says. She drops the burrito.

Time stops. My heart stops. The world stops.

She.

Said.

No.

Way.

I am not breathing. I realize this just as she claps her hands over her mouth in horror and I inhale and she inhales, and then she says, “I mean, ‘yes,’ of *course* but *no way* because of *this* —”

And now she’s digging in the change pocket of *her* jeans and she produces a something that sparkles in the last rays of the sun. “I made it myself,” she says, holding up the ring in her hand. “Out of petrified bogwood.”

“I made mine by hollowing out a nickel and polishing it. I engraved the rim. It says LOVE, in UTF-8 encoded binary.” I show it to her.

“The one I made for you says ALWAYS in Morse.”

We hold our rings. Then she grabs my hand, folds the fingers down until only the ring finger is out, and slips it on.

I do the same to her.

“Will you?” we say.

“Yes,” we say.

The kettle didn’t lift for five more hours. I hardly noticed them. And that time, neither of us went to jail.

There was always next time.



PERMACULTURES

by Madeline Ashby

© Madeline Ashby



ARIZONA STATE UNIVERSITY

Because Hobson was convicted in California, he served the first six months in San Quentin. It wasn't easy, but Hobson liked the location. He liked knowing that his facility was on the most desirable waterfront property on San Francisco Bay. Developers and lawyers and neighbourhood associations all over Marin County had tried to get rid of it. Even Disney had tried, once. But no one had been able to budge it. So there it sat, a cluster of ugly blocks filled with uglier stories, raising its concrete middle finger at the wealthy of the west coast. Hobson directed his mind at that truth when he was feeling low. You had to hold onto that kind of mantra, inside. Doing so got you through the loud nights and the three am panic and the soggy printouts of meat on the brittle printouts of food trays.

And then, after Christmas, they told him he was going to Detroit. A representative from Lionheart showed up and asked to visit him. Hobson assumed it was to serve him a subpoena, but the rep arranged for a private room where the two of them could talk, and he came armed only with a tablet. He stood up when Hobson entered the room, and he was only a tiny bit awkward about shaking Hobson's manacled hands.

"Doug Matheson." He unbuttoned his blazer and gestured for Hobson to sit.
"Please."

Hobson sat. "Are you here to serve me something?"

Matheson grinned a professionally-whitened grin. “No, sir. I’m here to make you an offer.”

“I’m not giving up any further information.”

The grin did not slip. “What do you know about vertical farming?” Matheson asked.

“I interned at a couple of them. One in Oakland, one in Baker.”

Matheson raised his eyebrows. “Baker? Ouch.”

Hobson shrugged. It seemed like a lifetime ago. At the time, he’d bristled at the tarantulas and the duster-drones and the meth-addled hillbillies trying to brew their own ethanol fuel from rotten corn. Now he realized it was one of the places that made him who he was; seeing those farmers so powerless was what gave him the urge to help them help themselves. “Summer jobs, right?”

Matheson nodded. His hair was almost perfectly gelled; when his head moved, none of his hairs did. “You know who owns this facility?”

“You do. Lionheart does. Or at least, their correctional division signed a contract with the government to manage it privately.”

“You used to work for us, right? As a geneticist?”

“Until you pressed charges for patent infringement and corporate espionage, yeah.”

“Because you were helping some farmers?”

“I was teaching people how to save seeds in my off time. I was talking about how to do some basic open-source engineering of plant RNA. To make crops more resilient from year to year, without paying a licensing fee.” He shifted in his chair.

“It was just seminars. Bad coffee. Donuts. Beer afterward. That’s not how the state prosecutor saw it, but that’s what it was.” He looked at the camera in one corner of the room. It was an ancient black dome; he figured there had to be another unit in the room, somewhere, too small for him to see. “Why are we going over this? Didn’t your higher-ups tell you this already?”

“I wanted to get it straight from the horse’s mouth, as it were.”

“Well, you won’t get it any straighter than what I said in court.”

“Lionheart would like to send you to Detroit. They operate an agricultural facility, there, in one of the old office towers.”

“And you want me to go work there? Is the State of California okay with that?”

Matheson peered at his tablet. “We wrote a letter on your behalf,” he said.

“Something telling the State how much we’d appreciate it if you could be moved.”

Hobson stretched his legs. Doing that was tough, in his cell, and his mind was never on his body during the outdoor shift. It was always focused on the other bodies around him, and how close they were getting.

“It’d have been nice of you to share that with me,” he said.

“We had to submit the request on a very tight deadline,” Matheson said, folding his hands. “And we knew that you would want to make the transfer, once we made our offer.”

“Oh yeah? And what offer is that?”

“Boost yields in the Woodward Avenue Agricultural Tower, and one year later you’ll be out of the system.”

Hobson swallowed. He willed himself to be calm. It was the sort of offer you dreamed about: just do this one thing for them, and they'd let you go. It relied on basic childhood logic: click the ruby slippers, and you'd get to come home. His sentence was for fifteen years, and at the time his lawyer treated it like a win. Now they wanted to let him out next year.

"What's the catch?"

Matheson smiled. "It's a competition," he said. "You'd be doing your best to raise the yields in Detroit, and someone else would be doing the same in Virginia."

"Virginia?"

"The Shenandoah Women's Correctional Facility, to be precise. They operate a free-range organic farm. You'd be competing with them."

Hobson's eyes narrowed. "Why? That's apples and oranges. Literally. Why would you pit such different processes against each other?"

"We're...prototyping multiple solutions to the problem of food shortage. It's early days, so we'd like to start case studies with closed systems."

"So you're experimenting on a prison population?"

"We're offering offenders like you the opportunity to give back to their communities by participating in much-needed research."

"Right." He sucked his teeth. "I suppose I should appreciate your candor."

"I suppose you should appreciate my *offer*," Matheson said, pushing the tablet across the table.

It was all right there, glowing and pulsing and real. His attorney had signed it, too. There was even a notary watermark. It pixeled and glimmered under Hobson's finger.

When he opened up the document, he saw images and maps from both facilities. The Woodward Avenue Agricultural Tower was bland on the outside, save for its solar panels and the mirrored louvers on its edges. When he squinted, Hobson could see the suicide nets at regular intervals, belling away from the body of the tower like a debutante's petticoats at cotillion. Inside, it was a panopticon. Not literally—there was no central tower—but they were very proud of their surveillance technology. Facial recognition. Biometrics. Algorithmic riot prediction. Composting toilets with bowls that could do a drug test by remote. They'd know you were sick before your first sneeze. It was easy, because offenders never left the building.

By contrast, Shenandoah was huge—a cluster of buildings out in the middle of deep green nowhere, miles up the Blue Ridge Mountains and far away from the highway. The fence was trivial. He could see why. Not only was the environment punishing, the literature said something about raising deer and boar out in those woods. Deer meant wolves. It was right there: *The majority of dangerous predators at Shenandoah Women's Correctional Facility are outside, not inside. The forests surrounding our farm boast an above-average wolf population. We take this as a sign of a healthy ecosystem.* Escaping from there would be like walking out of a Siberian gulag. What botflies cruised the skies were probably there to make sure you didn't wind up getting eaten alive.

"How many market-ready solutions can you develop at an organic farm?" Hobson asked. "I mean, given the regulations on GMO and organics. I'm sure they're using your surveillance tech, but that's about it, right?"

“And our logistics software.”

Hobson snorted. “Now I get it. You want Detroit to win. Because whatever gets developed there belongs to you, and you can turn a faster, bigger profit on another set of seed traits than you can on a total organic overhaul.”

Matheson smiled. He almost looked a little gleeful. “It’s good for us, too, Dr. Hobson. We did promise the State of Virginia that we’d re-forest the land after taking all the coal. Organic farming is just the ticket.”

Hobson blinked. “You’re doing this to keep a *subsidy*?”

“We’re paying a debt to Virginians,” Matheson said. “And you’re paying a debt to society.”

“Does my competitor have experience comparable to mine?”

Matheson’s smile deepened. He steepled his fingers. “I think your experience is a little more special than that, don’t you?”

“But you’re making this same offer to her?”

He nodded. “Yes.”

“Well, what’s she like?”



Jarvis was high up in a blind watching the piglets when Rodriguez’ botfly came by. It settled on her shoulder and chirped at her: “*Come on back, Jarvis. I have something for you to look at.*”

Jarvis continued watching the piglets. She had no intention of returning to the compound. It was a long walk, through falling snow and hidden ice. And this sow

was the only one on the whole farm they'd allowed to roam while breeding. She and Willis had fought tooth and nail to try that. Now that she'd borne her piglets, Jarvis intended to see the experiment through and report to Willis when she returned. Besides, she'd worked hard to earn overnight privileges. She'd taken on extra KP work, cleaning the grease trap and scaling the black mold from under the fryer and scoring Gold Stars (™) each time she did. She was going to watch the piglets, damn it, and Rodriguez could suck on that.

She said none of that, though. What she said was: "I can't. Whiteout conditions. Supposed to clear up tomorrow morning, though."

"It's important, Jarvis."

Jarvis rolled her eyes and hoped Rodriguez couldn't see it through the botfly. "I'm right here listening to you, ma'am." Rodriguez was an uptight lady who liked hierarchies of all sorts. It explained her vocal Catholicism and her perfectly smooth ponytail and the way that she, unlike all other women in their thirties, enjoyed being called *ma'am*. At least, she seemed to enjoy it. When they spoke in person, Jarvis noticed her perk up when anyone ma'am-ed her. Privately, Jarvis saw it as a symptom of an undiagnosed personality disorder.

"It's private. I'm not allowed to discuss it over public channels, and you're not allowed on any of the private ones. So come on in. You can overnight next weekend."

Jarvis almost mentioned that Willis was scheduled for next weekend's overnight, but she knew it wouldn't help. Maybe Willis would trade her places. Probably not. Either way, it wouldn't help. If Rodriguez really wanted her to come in, that was what she was doing. She could drag her feet the whole way, though. That was something.

Afternoon slanted down toward evening as Jarvis made her way back to the compound. Jarvis squinted into the blue shadows and looked for markers before starting her trudge. She knew the path to the blind fairly well, but it never hurt to check. Lionheart said it had reinforced the shafts below Shenandoah Correctional Facility for Women, but Jarvis didn't exactly have much faith in the company. Lionheart had owned all this land back when they were blowing the tops off the mountains to mine it, and in her opinion they'd been equally cutthroat about giving the area to their correctional services division when the land was used up. She had looked it up during one of her computer timeslots. The valley fill in this area was nothing more than "topsoil substitute." There was no telling how it would hold up over time. It tended to form pockets, like silt, and it could liquefy in the event of seismic activity, instantly opening up the four-hundred-foot drops down into the old coal veins Lionheart had left behind. They'd done a bunch of sonic testing to determine where these pockets of silt were, and marked them with dowels and tiny flags in neon pink. Willis said there was an augmented reality map that employees and wardens could access with the right pair of glasses, that showed the same markers and the depth of each pocket. Offenders didn't have those.

It was almost fully dark when Jarvis reached the compound. The guards in the northwest tower blinked their arc lights at her. She waved back. As she did, the RFID in her body told them who she was and why she was coming. Jarvis had no idea where they'd stashed the RFID. They put you down while the local happened, so you couldn't go digging it out, later. Offenders who tried, who showed up at exams with odd wounds, lost points and couldn't do privilege activities.

She held her hands up and spread her legs for the scanner once she passed the doors. There was a blast of hot air, and the magnet in the scanner made its

quick revolution around her. The guard watching it confirmed the machine's assessment, and let her through. Glowing arrows embedded in the floor pulsed and ushered her in the direction of Rodriguez' office. When she got there, Baby opened the door and gave her a final check. Baby was Rodriguez' favorite. She was technically an offender, but she'd started sucking up her first day and now she worked as Rodriguez' lieutenant. She was a huge woman, blonde with big blue animé eyes, and she spent all her points on makeup and perfume. This week she smelled like peaches.

"She's clean," Baby said, when she finished feeling Jarvis up.

"Thank you." Rodriguez handed Jarvis a biodegradable cup of lukewarm apple cider. Truly hot drinks weren't allowed in the facility. You could use them to hurt somebody. But it was a nice gesture nonetheless, and Jarvis saw the apology in it. She raised her cup to Rodriguez, and the warden offered her a seat.

"How are the piglets?" Rodriguez asked.

"They seem okay."

"How many?"

"Seven."

"That's a good number."

Jarvis almost asked Rodriguez what the hell she knew about animal husbandry, but then decided that doing so would only open her up to more conversation. She waited, instead. Rodriguez shifted in her seat, sighed, and brought out a tablet. She pushed it across the desk to Jarvis. Jarvis waited a moment before picking it up. When she did, the document lit up and started unfolding itself into multiple panels, explaining what looked like a Lionheart scheme to raise the

total productivity of two facility farms as part of a case study. She focused on the bolded print. The metrics were absurdly simple: megawatts, weight, toxins, hours.

“There’s nothing, uh, *qualitative*, here,” Jarvis said.

“Huh?” Rodriguez asked.

“You know that expression? It’s not the quantity, it’s the quality?”

“My ex used to say that,” Baby said, from the corner of the room. Her hands twisted on her copious stomach. Her belt looked like it was cutting her in half, and Jarvis had a moment of sympathy for her. “I think he was talking about his wiener,” Baby added.

Rodriguez cleared her throat and shifted in her seat once more. “I’m familiar,” she said. “What does that have to do with this?”

“This competition, or whatever it is, has no way of measuring success in a way that’s relevant to our output. The only chance we’ve got is in the Toxins sector. Our samples should score perfectly, there, but there’s no way we can boost this farm’s output to match Detroit’s in a year. Not without more acreage. And we’d have to clear trees for that, and we can’t do that without breaking the re-forestry agreement and losing our operating budget.” Jarvis leaned back in her chair and folded her arms. The apple cider had done nothing to banish the cold that seeped into her limbs on her hike back to the compound. “Didn’t Willis already tell you this? She’s foreman. Woman. Whatever.”

Baby pointedly looked at the floor. Rodriguez smoothed her ponytail. She laid both hands on the table. Her nails were elegantly rounded and painted a soft pink. Jarvis had a hard time telling if they were real or not. Getting a manicure for this job seemed like a stupid idea, but she’d seen worse.

“Willis killed herself this afternoon,” Rodriguez said.

For a moment, Jarvis tried to figure out how Willis had faked her death. She wouldn’t have been the first to try. The RFID made it easy, if you could just find the damn thing. What annoyed her was that Willis might have done so without telling her, first. The two of them worked together almost every day. They’d shared a lot. They co-wrote the proposal that more of the farm’s yields be held back for offender consumption, arguing that it would increase Shenandoah’s self-sufficiency. They had delivered baby goats together last spring. Willis had even helped her with her stupid ingrown toenail, that one time, just so she wouldn’t have to miss out on the garlic planting. Jarvis had thought they were friends.

The last time she’d seen Willis, she was on her way to visiting privileges. “You keep an eye on those piglets,” Willis had told her.

“It’ll be your turn, soon enough,” Jarvis had answered.

“Right,” Willis said. They smiled at each other and walked away.

Jarvis looked up at Rodriguez. “That doesn’t make any sense,” she said. “Willis was fine. She was happy. She was seeing her son, today.”

Rodriguez frowned. “Her son?”

“Yeah. Her son. He was visiting, today. That’s why I had the overnight with the piglets, because he was coming this weekend. She was taking the overnight next weekend, because he couldn’t make it next weekend. It’s called a *schedule*, Rodriguez.”

“Don’t take that tone with me.”

“Well, if you would take the time to figure out what’s going on in your own damn prison, I wouldn’t have to!”

Rodriguez leaned forward over her desk. “Look. I know this is hard-”

“Oh, shut up—”

“—But I’m telling you the truth. Willis killed herself. Her son didn’t come, today. He wasn’t going to come, ever again. He was in an accident, right before Christmas. *Some drunk coming back from a party T-boned his car.* They took him off the ventilator, today.”

Jarvis opened her mouth. Then she closed it. Willis had said nothing about her son being in an accident. It made sense: the boy was young and he hadn’t earned his manual license, yet. That was another thing they had in common: their kids were young. It made every birth on the farm more meaningful. That was why they’d been so concerned about the piglets.

“Oh, Christ,” she murmured, as her vision swam.

“I’m sorry,” Rodriguez said.

“Yeah,” Baby said, in a tiny voice. She wiped her eyes. Her sparkly blue mascara smeared as she did so. Watching the pigment spread across her moon face, Jarvis was able to marshal her own tears.

“Okay.” She blinked hard. “Okay. So, what? I’m taking over? Is that it?”

“That’s what we’d like to see happen,” Rodriguez said.

“Sure.”

“There’s one more thing.”

Jarvis gave her a look that she hoped said *you have got to be kidding me*, but Rodriguez met it with her own resolve. She folded her hands. Her wedding ring looked as though it were welded to her finger; she'd first put it on twenty pounds ago.

"If you're able to boost the yields, you'll be writing your own ticket out of here."

Jarvis squeezed her eyes shut. Then she popped them open. They burned with unshed tears. "What?"

"You'll be able to get out of here. Just complete this one project successfully."

She made her gaze bore into Rodriguez', but the warden's face remained a perfect blank. It was how you could tell someone had been in the system for a long time: their expressions could go instantly as flat and opaque as a frozen pond. She looked at Baby, instead. Baby gave her a little nod. This was the real deal, at least as far as she knew. But something wasn't adding up.

"Did Willis know?" Jarvis asked.

"What do you mean?"

"I mean, did you tell her? That she could go home? If she made this happen?"

Rodriguez said nothing. She looked away. Jarvis felt the rage fizz up from her spine to her skin, as natural and effervescent as something long in the brewing, and before it could come pouring out her mouth she stood up. She marched to the door. She opened it. No one said anything. And then she left.



Hobson arrived in Detroit late in the afternoon. The other guys on the flight were all minimum-security, just like him. When he told them he was a geneticist, they all assumed he was from the Emerald Triangle. “You were selling off-list, right?”

“No,” he said, and then he went on to explain how intellectual property law impacted the market availability of genetically-modified crops until their eyes glazed over.

After the flight came a ride in a van. They were going to a skyscraper. One of the ugly cookie-cutter ones, not one of the interesting Art Deco ones. Those didn’t have enough windows to make vertical farming work.

“From the top, you can see Comerica Park,” the guy driving the van said.

“We’re allowed on the top?” Hobson asked.

There was a pause. “No,” the driver said. “I guess not.”

The rest of the ride was silent, as they wound their way through downtown. The tower was north of the 3D district in the Cass Corridor, where all the fabbers and printers made their living churning out whatever the manufacturers had stopped making. You could buy a whole car kit, out there. They’d print out the panels and the dash and the bumpers and rims, and you’d snap it together over whatever chassis you liked. Like those primo Japanese hobby car kits, only bigger. At least, Hobson had heard that was how it worked. He’d heard about it right before he first entered San Quentin. It was a nice thought, people doing something like that for themselves. Making something they used to have to buy. It was like watching the auto industry return to Detroit in cottage form. Once upon a time, stereos and furniture worked that way, too, so he guessed things were just coming full circle.

Through the tinted glass, Hobson tried to spot some of the printed cars. He thought he saw some likely candidates: Impalas and Corvettes and Camaros and El Caminos, all with that odd surfboard texture that indicated a glossy print job. They drove lighter and more nimbly than their original source material. They weren't carrying that old weight.

They pulled up to the tower from around the back, via an alley. Hobson wondered if he'd ever see the building from the front. Probably not. That was the employee and visitor entrance.

Inside, they were led through a series of back hallways. Hobson guessed they'd once been maintenance passages. He had no idea what the old building used to be; the floor-to-ceiling windows he'd glimpsed indicated it was once an office.

He was about to become a farmer on the set of *Die Hard*. Yippie-ki-yay.

In the elevator, it began to seem real for the first time. He'd thought it would feel real once he got in the transports, or maybe on the plane, but it didn't. Airplanes always felt like some sort of canned reality, anyway—you were never truly free while flying. But now, as he felt the floor drop away from him, it occurred to him that this was really happening. They were going to let him out. If he could win. If he could somehow boost their numbers.

Of course he could boost their numbers. He was a genetic engineer specializing in crops. By the time he was through, Lionheart would think he'd put their soybeans on steroids.

The elevator clunked into place and its doors whispered open. A guard prodded Hobson's back gently. He stepped forward into a hallway floored in old, peeling linoleum. On either side were greenhouses. The plants were stacked on mobile racks, like library books. They were seedlings. Soybeans, by the looks of them.

The air hummed with bees. It tasted different. The vague urine-and-disinfectant taste of most prison air conditioning was completely absent. Here, the air reeked of shit in an entirely different way. Here, it was fertilizer.

He pressed his fingernails into the palms of his hands to keep himself together, and kept walking.

The door to one of the greenhouses opened. Out stepped a black man in a warden's uniform. At least, Hobson assumed it was a warden's uniform. It was a set of khakis and a belt, and offenders didn't usually get belts, because they could hang themselves or strangle others with them. Then again, he wasn't even sure that color was really "khaki." It was more like a non-color, a total absence of any differentiating shade that could only be found in Schroedinger's crayon box.

"Mr. Hobson." He nodded at the guards flanking Hobson, and they started un-cuffing him. He offered his hand, and Hobson shook it. It was wet. He'd just washed some dirt off, maybe, or had sanitized in expectation of hand-shaking. "My name's Everett. Let's get you situated."

"Are you my warden?"

"I'm the closest thing you've got to a partner on this job," Everett said. "I run this building."

"Excuse me?"

Everett jerked his head down the hall, and Hobson started after him. "I can't take you to the control room, but that's where I work usually. But since we've started this whole new thing, I've moved some of my operations up here."

"You're the building manager, then?"

“Sort of. Things are different out here. I’ve been working for Corrections for... eighteen years now, I think. Yeah. Eighteen. Got my first job with them when my son was just about a year old.” Everett smiled. “Of course back then, I was working maintenance. I ran a janitorial crew. Mostly guys with something going on, up here.” He pointed at his head. “Now I run the buildings.”

Hobson frowned. “Even the security?”

“At the local level,” Everett said. “But the company has a master control center, out in Utah, where they log all our data and let us know what’s really going on.” He rolled his eyes. “Like I need a goddamn algorithm to tell me when there’s gonna be a problem.”

“Full moons and heat waves, right?”

Everett nodded. “You got it.”

As they walked along the hallway, Hobson noticed the other offenders working quietly among the plants. They seemed either very old or very young. No one in between, except Hobson himself.

“You’ve got some pretty extreme demographics, here.”

“It’s another pilot program,” Everett said. “We’re trying to help the old guys hold onto their brain power, longer, and we’re trying to teach the kids some skills. Get them before they join up with one of the gangs inside.”

“Nice.”

Everett shrugged. Hobson guessed he’d seen a lot of pilot programs and initiatives and public-private partnerships, in his time. This was probably nothing new, to him.

“In here.” Everett gestured, and Hobson followed him toward a door. Everett waved it open with one hand. Inside was an office of sorts. Most of the available space was occupied by boxes with Lionheart labels.

“Your first job is gonna be learning everybody’s name, and where they go,” Everett said. “Your second job is to get all this crap out of my office and start using it.”

Everett handed him a tablet. On it was a manifest: seed chippers, heat lamps, pipettes, a centrifuge, electrophoresis gel. Basic genetic engineering kit. Hobson would have preferred a .22 caliber viral load injector, but he guessed that directly shooting the plants probably wasn’t within the facility’s allowable risk parameters.

“We’re primarily plants, here?”

“Yeah. The ladies over in Shenandoah do most of the meat. We grow some meat, here, in vats, but it’s nothing special. You put down the sponge, you squirt the ink, and shazzam, Salisbury steak.”

“Do you stimulate the tissues, at all?”

“I’ve got an old car battery, if you’re interested.”

Hobson snorted. “Great.”

“Oh, relax. You’re gonna make it out of here. It’ll be easy. The guys here, they’re just doing what they saw on Wikipedia. You actually have the know-how. You’ll bring up the numbers in no time.”

Hobson nodded. He contemplated the tablet. “Is there a map in here?”

“There’s maps everywhere. If there’s a fire, or an alarm goes off, you head straight for the stairs. There’s one set, just outside that door. In an emergency, the doors

open and you can head on down. Any other time, you have to wait for the camera to recognize your face and let you through.”

“How many floors can I access?”

“All of them, except the bottom ten and the top three. The bottom ten are standard procedure, and the top three are where the solars are, and nobody—*nobody*—is allowed to touch them. They’re *expensive*. Leave them alone.”

“Message received.”

“Other than that, you’re golden. You’ve got a bunkie, but he’s harmless. He’s a kid. Went up for stealing scrap metal from the wrong junkyard. His name is Paul.”

“Paul what?”

“Paul nothing. Paul’s his last name.”

“Right.”

“Good kid, mostly. Nicer now that he’s not high. Good hands. Good with the pruning and deadheading. I think he used to mow lawns.”

“Okay.”

“Nervous as hell about you, though. And about these.” Everett kicked one of the boxes, and inside it, something chattered. The sound of fingernails on plastic resounded through the tiny office.

Hobson frowned. “What’s in there?”

“Spiders.”

The rattling continued. It was a raspy sound, like someone teasing a cat with her fingertips. Hobson swallowed. The boxes said nothing about a biohazard, and

gave no warning, like “DANGER: EIGHT-LEGGED NIGHTMARE INSIDE,” but this was Lionheart. He doubted they cared. “Do you mean *real* spiders?”

Everett rolled his eyes and sighed. “Real spiders. My ass.” He kicked the box again, and a small black machine climbed out. It looked like a kid’s toy. It had rubber feet and jointed legs.

“Those are your tillers,” Everett said.



Jarvis didn’t really think about the project, for the next little while. She got the files on her competitor, and she tried reading them, but the words all blurred together and didn’t make a lot of sense. This had nothing to do with Willis’ death. She just couldn’t read very well. It was a learning disability. Jarvis had always considered that the wrong term for what her problem was. She learned things just fine if she heard them, or did them with her hands, or spent the time sketching them out. Words were just harder. More slippery. Words were how people tricked you.

That’s what made her nervous about examining the documents Lionheart had sent. She knew she had to take the project on. If she didn’t, they’d give it to someone else, and that someone else would have a shot at early release. And even if they didn’t make it out, they’d maybe make a bunch of plans that wouldn’t do the farm any good. Nobody here really cared about the farm as a whole. Sure, she knew some ladies in her dorm who cared about their parts of it—the chicken coops, the apiary (or whatever it was called—”apiary” sounded like a place where chimps should go), and so on. But they were also always the first to start squawking when you told them that some of the hens were obviously done, or

that the turkeys would in fact be used that November. They got all weepy and weird just because the animals were fulfilling their purpose.

They didn't have the vision to manage a place this big. Doing so meant understanding things like loss. Willis would have understood that. But Willis had checked out.

Willis' bunkie was a very pregnant girl named Lindy, and she was in charge of cleaning out Willis' things to give to the rest of her family. Jarvis went along to her cube to help her out with it. She was really too big to be moving boxes.

"You ought to be in the clinic," Jarvis said, when she saw Lindy rubbing her back. She looked to be carrying twins. Jarvis couldn't remember if she was, or not. She was a lot better about tracking the animal pregnancies on the farm, not the human pregnancies in the cubes.

"Can't," Lindy said. "Doc says there's a flu going around, so I should stay out."

"Well, that sucks."

"Yeah." Lindy wiped her eyes. "Hormones, right?"

"Sure."

"You got any kids?"

Jarvis gave Lindy a look that said she should stop asking. They continued packing, in silence. "When are you due?" Jarvis asked, finally.

"Two weeks," Lindy said. "I think he'll come early, though. My daughter came early."

"Yeah?"

“Yeah. She was all up in my ribs, and then she dropped, and after that, she was...”
Lindy made a gesture like a kid going down a slide. “*Whoosh*. Outta there.”

“How old is she now?”

“Three.” Lindy smiled. “Oh. That reminds me.”

She turned, and reached under her pillow. She brought out a sheaf of waxed kitchen paper, cut into small squares. Inside the squares were leaves and flowers pressed whisper-thin. “She made these, whenever she could go outside. I think you should have them.”

Willis’ handwriting was on each square. She’d dated all of them, and even included the Latin names. She must have looked them up. Jarvis had trouble really reading them, but she appreciated the effort. How must Willis have searched? How did she do that, without some fancy recognition program? Did she pull out books and flip to the back and index the plants? The process wouldn’t fit together in Jarvis’ head. It occurred to her that she had no concept of how Willis had done this. And she couldn’t ask, either. If she’d known Willis were doing this, if she’d known that Willis knew how to do this kind of thing, she would have asked. But now Willis was gone and she couldn’t.

“It’s okay to cry, you know,” Lindy said in a tiny voice.

“The hell it is,” Jarvis said, and wiped her eyes with the ball of her hand. She sniffed hard. Swallowed her snot. Stood up straighter. Blinkered. “Is this all of it? Do you need help with anything else?”

Lindy cast a look around the tiny cube. Willis’ hooks were empty. Her bed was stripped. There wasn’t even a stain on the mattress. “I guess not,” she said. “I’m

taking her laundry detergent. And her soap. Unless you need extra. I'm sure she'd be fine with giving you some."

Jarvis shook her head. "You take it," she said. "Waste not, want not."

It wasn't until she was back in her bunk that she realized what she'd said.

And then she began to draw up her plan.



"Genetic engineering is like any other kind of engineering," Hobson told Paul, as they examined soy sprouts. "All you're trying to do is fix something that's broken, or improve on what's already there."

"Like with a car?" Paul asked.

Paul asked about cars a lot. He was a true son of Detroit, and cars were on his mind constantly. He'd confessed, privately, that this was how he knew junkyard security systems so well. He browsed them regularly. He almost never had any money to buy anything, but he did keep a running mental tally of every part available, and even managed to make a list of the parts he needed next. This was what made him useful. He had a perfect recollection of all the crops in the tower.

The first ten floors of the tower were administrative. They held wardens, and there was a big server farm in there. The heat from it fed into the hothouses and helped them grow bananas and tomatoes and avocados and oranges all year round.

"Like with a car," Hobson said. "Now. Explain to me why these soybeans are under heat lamps."

"To make them get sick."

“To make them more *likely* to get sick.”

“More likely. Whatever. Once they’re sick, you’re gonna inject them with a virus, and the virus has DNA from another plant in it.”

“Well, the same plant, just a different *trait*.”

“Right. A *different* trait. The one you got out of the beans you chipped.”

“And because the trait came with the virus, what changes?”

“The RNA. The sick plant carries the trait, and passes it along to all its future generations.” Paul tilted his head at the delicate spirals of each soybean sprout.

“Can you do that with all kinds of traits?”

“Lionheart has patents on hundreds of traits.”

“Do they have patents on human traits?”

Hobson smiled. “That was above my pay grade, when I worked there.” He pressed a finger to his lips. “Besides. If I told you, I’d have to kill you.”

Paul rolled his eyes. “Dude. Don’t make that kind of joke in here. Not cool.”

“Okay, okay. Not cool. I got it.”

“Seriously. This is a pretty sweet spot to be locked up, but there are some screwed-up people in here. You don’t wanna piss ‘em off.”

“I won’t. Don’t worry.” He wiped his hands on his jumpsuit. “Now—”

“Dr. Hobson?” Everett’s voice rang out above them. Hobson thought it was nice how Everett remembered his title. He didn’t have to.

“I’m right here,” Hobson said.

“*Got a call for you.*”

Hobson looked at Paul. He didn't really have any friends, since going inside. Something about his refusing to settle, about his "all-too-predictable insistence on dying on every hill." That was what Julie said, when they broke up. She couldn't be with him, knowing he'd brought this on himself. It was irresponsible of him, to treat himself and their relationship this way, to shut their future down. At least that was what she'd said. He'd gotten the occasional message from her and their friends, when he was in San Quentin, but in the month he'd spent in Detroit he'd heard nothing. Out of sight, out of mind.

"Who is it?"

"Well, now, that's the interesting part. She's your competitor. Your opposite number. From Shenandoah. Name's Jarvis."

"Is she hot?" Paul asked.

"This isn't your conversation, son. And given that all of our conversations are recorded, I choose not to speculate. Get to a terminal, Hobson."

"Will do." Shrugging, Hobson zipped up his jumpsuit a little higher, and sanitized his hands. He ran a hand through his hair. He turned to Paul. "How do I look?"

Paul raised his eyebrows. "Seriously?"

"Never mind."

He made his way to a terminal and waved his thumb over it. The *call waiting* icon popped up, and he pressed it. The screen filled with a woman's face. She looked like a character from Vermeer: pale, sharp-edged, pleasantly plain. He had forgotten what machine illumination did to human skin. In natural light, he guessed the sunburn bridging her nose would be a lot closer to red than pink.

"You're the scientist, huh?" she asked.

“That’s me. You’re Jarvis?”

“Yeah.”

“Nice to meet you.”

“Thanks.” She didn’t say it was nice to meet him. It probably wasn’t. She knew he was going to win this thing. Maybe she was trying to gain sympathy. Or maybe she wanted to collaborate on some way to screw over Lionheart. He wasn’t above that, obviously. But he’d prefer to do it from outside the confines of a secured facility.

“How’s Virginia?” he asked.

“Cold.” She blinked. “Have you ever been out here?”

“Just the beach.”

She nodded, briskly. The beach didn’t count, apparently. He could understand that. Seeing Disneyland didn’t really count as seeing California, either, even though they had a whole subsection devoted to that very purpose.

“Do you really have wolves, out there?”

She smiled. At least, he thought it was a smile. It was a motion of the lips, in any case. Just the slightest tug to one corner of her mouth. “Yeah. There are wolves.”

“How do you...” He made gun fingers. “I mean, if you’re out there alone...?”

“We’re not alone, very much. They stay away from groups. And if you’re alone, and you see one, you press the panic button in your shoe. Tells them to GPS your RFID.”

She said it like “arf-id,” which made him think of aphids. Maybe he should invest in ladybugs. Then again, he had no idea if the farm had an aphid problem. It was sealed from the outside, after all. How would aphids get in?

“Does Detroit really look like *Mad Max*?”

“No,” Hobson said. “At least it didn’t, when I came. But I only saw the route between the airport and here. Not Detroit itself.” He cocked his head and shoved his hands in his pockets. “What’s this about? Is everything okay, over there?”

Her face shuttered instantly. “Everything’s fine,” she said. “But I want some of your data.”

He frowned. “On the traits? You gonna try some crossbreeding?”

She snorted. “No way. I want your stats. Your...usage patterns, I guess. How much energy you guys use, how much food you all eat, how you manage it. You know?”

He didn’t know, but that was okay. If she wanted a baseline, he was happy to provide it. “Draw up a list, and send it to me,” he said. “I’ll give it to the manager here, and he’ll get you the charts and stuff. Whatever you need.”

“Just no DIY bio, right?”

He felt the smile fall from his face. “No,” he said. “I’m not helping you that far.”

“I don’t need your help,” Jarvis said. “I just need your data.”

“Good,” Hobson said. “Are we done?”

“We’re done.”

He waved her away with a single abrupt gesture, drawing a line across the projection of her neck with one finger.



It took Jarvis a while, but she managed to sketch up a plan. It probably wasn't the best plan for boosting the yields, but she had a feeling it would work if she could get enough cooperation and a few extra Arduinos. The project had a budget, though not much of one. She could get more sensors that way.

She proposed the plan to Rodriguez two weeks later.

"I don't see how this boosts yields," Rodriguez said.

"It doesn't," Jarvis said.

Rodriguez leaned forward. "I know the past few weeks have been hard for you, but—"

"Oh, shut up," Jarvis said. "Take a look at the numbers, Rodriguez. This place *wastes* more food than it produces. The harvesters still pick food like they're shopping at the grocery store—they won't pick up anything lumpy or *funny-looking*. That's hundreds of pounds of potatoes and apples lost, every year. You know I was talking to Andie? From the portables? And she said carrots *couldn't be purple*. I planted a whole bed of heirloom carrots last year, and she was telling everybody on her crew not to pick the purple ones, because they were moldy."

Rodriguez didn't look terribly convinced. Maybe she didn't eat a lot of purple carrots. Or maybe she just didn't care.

"I want to overhaul this place from top to bottom," Jarvis said. "I want the kitchen to be part of the rehab program—not just a job for points. We teach nutrition, we teach cooking, we teach seasonal produce."

“So the harvesters pick more?”

“Yes. And so they appreciate what they have. They throw everything out. Everything! The compost from dinner alone could be feeding a whole greenhouse worth of fruit and vegetables, off-season.”

Rodriguez shifted heavily in her seat. She was going through the change, and it wasn't treating her well. Sweat beaded up under her hairline. Her eyeliner was running. “I don't know about that,” she said, finally.

“That's because you're never here for night shift,” Jarvis said. “You don't see the dinner hour. You don't see how much food everybody throws away.”

Rodriguez sighed. “I thought the food was supposed to be good,” she said. “Farm fresh, and everything.”

“Lionheart keeps selling our produce out from under us! We don't have enough of a share in what we're growing! We should be giving Lionheart our remaining produce *after* harvest, not committing ourselves beforehand.”

“Oh, so your plan here is to remake the entire farming model,” Rodriguez said. “Farmers commit to yields, Jarvis. That's how it works. You tell your customers how much you're going to produce, and then you borrow against those projections.”

“Yeah, and that's how it's been for farmers since *Little House on the Prairie*! Don't you think it's time to move on?” Jarvis sighed. She pointed at the maps and charts and lists of figures. “Look. I know I'm not going to win this. Detroit has all the tech. They can boost yields without even trying.”

“So, if you're not showing me a winning plan, then-”

“I’m showing you a *system*,” Jarvis said. “A system that can make this entire facility self-sufficient. A system Lionheart can start up elsewhere. A system they can retail to other farmers.”

Rodriguez frowned. “Like Six Sigma, but for farming?”

“What’s Six Sigma?”

Rodriguez waved her hand dismissively. “Never mind. Forget I said anything.” She scowled at the documents. “You really don’t want to get out of here?”

Jarvis shrugged. There was no way to answer that question honestly. Did she think about getting out? Every day. Did she think about what it would be like if she tried to go home? She tried to avoid thinking about that. Dan had sold the house. He was with Alexis, now. At least, Jarvis thought that was her name. It was some awful soap opera name. In her head, that was what she looked like, too: some wasp-waisted blond with invisible eyebrows and cheekbones sharp as old brake pads. And when she smiled at Jarvis and Dan’s kids, the smile never reached her eyes, because she worried about crow’s feet. In Jarvis’ mind, that was what she was like. If Jarvis got out, she’d have to meet her for real. Have to spend time with her for real. They’d go to dance recitals and football games together, sitting on folding seats on opposite sides of a silent aisle, smiling when the kids looked at them and scowling the rest of the time.

“I want to build something that lasts,” Jarvis said. “If I boost yields, that’s great. But even if I won, and got to walk out, what would you do then? You’d still have the same problems with food production. And you’d still have to re-forest the mines in order to get the state’s money. So isn’t it better—”

A chime rang inside the office. Rodriguez waved a hand over her phone. “What is it?”

“It’s Lindy, ma’am,” the voice said. “She’s just had her boy.”

Rodriguez smiled. It was the first genuine smile Jarvis had ever witnessed cross her face. It lingered for a long time, and Rodriguez even shared it with her. “Well, that’s great news,” she said. “You tell her we’re very happy for her up here, and we’re hoping she makes a fast recovery.”

“I knew it was going to be a boy,” Baby said. “Her carrying him so low, and all.”

Rodriguez said nothing. Instead she focused on the window. “He came right on time. Soon, it’ll be spring.”



To: Hobson

From: Jarvis

Date: Feb. 28, 2032

Thanks for the data. It's been very helpful.

To: Jarvis

From: Hobson

Date: Mar. 03, 2032

Oh yeah? How so? What have you been doing with it?

Over here, we're chipping the beans and isolating some new traits. Lionheart will keep the patent on them, but I'm teaching my assistant more about how nature actually works. The other day I had to give

him a whole sex ed lecture. It was awkward. I guess he went to school in one of those abstinence-only districts. No wonder he dropped out.

To: Hobson

From: Jarvis

Date: March 07, 2032

I used it to compare our food production and energy usage. As it turns out, I didn't even need to ask. Lionheart makes all that stuff public in an annual report. I had someone here find it for me and show me all the parts I needed to look at.

There are a lot of girls like that in here, too. Pregnant ones.

To: Jarvis

From: Hobson

Date: March 08, 2032

But how are your yields?

To: Hobson

From: Jarvis

Date: March 12, 2032

Oh, they're normal. We're just not losing so much, now. It's just basic logistics. One of the girls, here, Lindy, she worked for a logistics

company. A corrupt one. That's why she's here. She understands about supply-side manufacturing and so on. She managed to eliminate a lot of inefficiencies in our process. (She was one of the pregnant ones.)

How are those spider tillers? Out here we just let the rabbits do that job.

To: Jarvis

From: Hobson

Date: March 13, 2032

I don't understand. Don't you care about the yields?

And the tillers are fine. Creepy as hell. My assistant hates them. I kinda hate them, too. Sometimes you don't even know they're in the dirt with you until they move. I think in the wild, birds would pick them up. They're too shiny.

To: Hobson

From: Jarvis

Date: March 17, 2032

Sure, I care. But mostly because I plan on eating them. I'm not setting aside any of our produce for Lionheart, this year. They can have our extras when we decide to fork them over.

To: Jarvis

From: Hobson

Date: March 18, 2032

Don't you want out?

To: Hobson

From: Jarvis

Date: March 21, 2032

Of course I want out. But I don't have any plans for what I'm going to do on the outside. I want to invest in the place I'm in right now.

To: Jarvis

From: Hobson

Date: March 22, 2032

That doesn't make any sense.

To: Hobson

From: Jarvis

Date: March 26, 2032

Sure it does. I have a place, here. I'm doing something. I have something to do. This is where I live.

To: Jarvis

From: Hobson

Date: March 27, 2032

You could live somewhere else. You could get out. You're smart. You must be, otherwise they wouldn't have let you do this. Lionheart could set you up. Hell, I'd even write a letter of recommendation, for what that's worth.

To: Hobson

From: Jarvis

Date: March 28, 2032

Thanks, but no thanks. What I have here is special. I know that probably sounds strange to you, but you had a good life on the outside. You had a job. You had a job you liked so much that you did it on the weekends even when you didn't have to. That's what you're in for. At least that's the impression I got.

I didn't have that. I've never had any job I liked that much. But I like this one. And I think that's more than what most folks have, even on the outside.

To: Jarvis

From: Hobson

Date: March 29, 2032

This is crazy. You've been brainwashed, or something. You could accomplish so much, out in the real world.

To: Hobson

From: Jarvis

Date: March 30, 2032

*No, *you* could accomplish so much. You're the one with an education, and a work history, and a network, and all that. You can go out and do whatever it is you feel like.*

I barely made it out of high school. I don't read so well. (That's why these messages take so long. I have Lindy check them over.) I didn't work too much before I had my kids, and even less after that, and I had them just out of high school. (My graduation gown barely fit, I was so big.)

So no matter when you get out, your future is brighter than mine. And the longer I stay in here, the more I learn. I'm not saying it's great. But this is the first time I've ever been good at something.

Everybody else I ever knew, everybody from my old life, they're all doing just fine without me. But the farm won't be the same if I leave. I'm the only one who cares about it this much. I know it's just a Lionheart scheme. I know the suits don't really give a damn. They're just re-forestation, like they said they would. But it matters to me. The

pigs and hazelnuts and stupid purple carrots, they matter to me. So I'm staying.

To: Jarvis

From: Hobson

Date: April 02, 2032

I'm sorry you feel that way. I guess I can see what you're saying—I've been lucky in my opportunities. I think that's one of the reasons I pissed off all my friends. Why they don't call me, anymore. Because I took all my opportunities and all my good luck and shoved it up my own ass. My guess is that you didn't have those same opportunities.

Well, if and when I get out of here, I'm going to give you one. If I make it out of here, if Lionheart isn't screwing with me, I'm going to start my own business. More DIY bio stuff. Maybe I'll even stay here in Detroit. There's a lot going on, here. A lot of people who are excited to make things. I wouldn't mind being a part of that. Beats the hell out of Palo Alto, anyway.

In any case, when you get out, come see me. I know you're a hard worker. I know you're smart. I know you're tough. I mean, you go out hiking with wolves, for Christ's sake. If you can handle that, you can handle Detroit.

Think about it.



ONE YEAR LATER

“Well, I have to tell you, Dr. Hobson, all of this is very impressive.”

Matheson had put on a little weight over Christmas. He had a shiny new watch. It looked kind of retro—a gold Casio, deliberately blocky, with a deliberately ugly liquid crystal display circa 1986. It had his whole wallet in it, though. That was something.

“I’m glad you like it,” Hobson said. “How’s Shenandoah?”

Matheson’s brows rose. “You worried?”

“Not worried. Just curious. I know they were trying some new things, and I wanted to know how they worked out.”

“I was under the impression that you were in regular contact with your competitor,” Matheson said. He folded his arms. “So you tell me. How are they doing?”

“They’re doing great,” Hobson said. “They boosted yields just by doing a damn efficiency audit.”

Matheson didn’t look too impressed. He did something on his tablet and watched a new chart spring to life on its surface. “Their animals are still underweight for the American market.”

“Half of the weight of supermarket beef is water, and you know it. Besides, they’re never going to supply fast food chains. They’re raising *boar* and *venison*.”

“Yes, and those are expensive animals to cull,” Matheson said. “They’re dangerous, for one. Our hunters asked for hazard pay for the boar. Boar’s a mean animal. Smart, and mean. Not like cattle.”

“So you’re not going to adopt the model Jarvis developed?”

Matheson scowled. “Not that it’s any of your business, but I didn’t say that. I’m just saying it needs...refinement. Context.”

Hobson made the face he knew Paul made when he was annoyed. It was a little troubling that he’d picked it up so quickly. It was like the accent. Already his A sounds were harder and flatter than they’d been, and he was starting to sound a little bit like John Cusack. “So you’re prototyping it elsewhere.”

“I didn’t say that, either.”

“If you do prototype it, will you give her credit?”

Matheson leaned back from the desk and folded his hands behind his head. “Why, Dr. Hobson,” he said, “isn’t that an ironic question, coming from you? Weren’t you the one who claimed that all information—especially *intellectual property*—wanted to be free?”

Hobson’s mouth formed a straight line. “I’ve reformed.”

Matheson grinned. “Good for you. And no. We intend on thanking Helena for her service, and including her testimony in our reports, and making sure she has all the Gold Star points she could ever want, and letting her do her thing.”

“I want her to get out sooner, rather than later.”

“Let me guess. Love is in the air.” Matheson tilted his head. As before, his perfect haircut didn’t move an inch. “You two really did become pen pals, huh?”

“If you let me out, I’m planning on starting a DIY-GMO incubator here in Detroit,” Hobson said. It was a lot easier to say it aloud than he’d expected it to be. “I’d like to implement some of her techniques, but on a broader scale. A community scale.”

Matheson sat forward. “You want to hire her?”

“That’s about the size of it.”

“Well, good luck to you, Dr. Hobson. She killed her last boss.”

Hobson blinked. “What?”

“Blew him away. She worked at a liquor store. He caught her with her hand in the till one night, and they got into an argument, and then she whacked him over the head with a jug of Carlo Rossi and took the sawed-off from under the counter and shot him. Apprehended two days later at her old boyfriend’s place. She’d already tried to kill herself by the time police broke down the door. Pills.”

Matheson stood up. “It’s a good thing you won this competition, Dr. Hobson. Because we were never going to let her out. We couldn’t. Even if we could, we would have put her in a halfway house with a permanent botfly. We can’t be responsible for what she might do. Those aren’t the kind of optics we want. She’ll get out in five years like she was always meant to.” He patted Hobson’s shoulder. “I’ll get the paperwork together. You know where you’re staying, tonight?”

“The train station,” Hobson said. “I think I’ll see Virginia.”

Matheson smiled. “Your funeral.”

Hobson nodded. “That’s what people keep telling me.”



MAKING A HOME
ZACH BERKSON

MAKING A HOME
by Zach Berkson

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ARIZONA STATE UNIVERSITY

The house had grown into the gardenias again. Linda scuffed at the NuGro tendrils that snaked from the house into her fledgling garden with the toe of her slipper. They bent and twisted in the dirt. Pulling her bathrobe tight around her against the early morning chill, she sighed and looked down the quiet street, to where the sun was just beginning to peek over the horizon. The problem with a photosynthetic house was that it grew toward the best sunlight, a spot currently occupied by her gardenia bushes. The bloody house was supposed to be dead, anyway. The NuGro workers had already sprayed it with a short-lived bactericide, right before Linda and Scott had moved in. That should've stopped the growth.

Linda did her best to avoid looking at the house as she went back inside. Its marbled, grown-plastic walls crept her out. It was too warm, too bright. Entering it felt like being swallowed alive by some Melvillian whale. She couldn't help the feeling that the creatures that had made these walls, the tiny bacteria that crafted carbon shells around themselves and died, a hundred generations every day, walls and ceiling and floor, that they were still alive, watching her, always growing. Her attempt to paint the living room had failed when the walls themselves expanded, slightly, over a period of days, and the latex paint cracked and peeled and fell to the floor. Finding the NuGro out in the garden confirmed her fears: the house still lived. She shivered.

Scott was sitting at the kitchen table, scrolling through the day's headlines on his tablet as she came in. "I made coffee," he said when he heard her approach.

Linda huffed, muttered something about the "bloody gardenias," and tossed back her light brown hair, a move Scott remembered finding attractive in college, when they'd met, that now struck him as petulant. He watched as she got a carving knife from the drawer and walked back outside. Linda was not good with mornings.

Scott sighed and ran his fingers through his thinning hair, then along the NuGro wall of the kitchen. It had been his idea to move into this experimental home, built from the NuGro company's living polymer, the building material used in so many new structures springing up across the country. Linda had gone along with the idea, reluctantly, but only because the NuGro house had been so much cheaper. Fresh out of grad school, both of them, and already able to afford their own home. And as part of something bigger, too: the NuGro buildings were only the latest movement toward sustainable technologies. A house that ate carbon dioxide from the air at rates faster than trees or algae, that filtered atmospheric pollutants and turned them into something clean and new: a fresh start, for Scott and Linda, yes, but something bigger too.

Linda initially moved in with a fervor, planting a garden in the front yard, throwing a mixer for the neighbors, rearranging the furniture to her exacting standards. But her verve died down after a few weeks and she grew distant and listless, avoiding him, sleeping poorly, finding excuses to spend time away from the house. He noticed her sometimes, standing out in the garden and glaring at the outside of the house, which, granted, was a far cry from its neighbors with their two-car garages and late-20th century suburban architecture. This house

was squat and pale, like a translucent mushroom or a coral bloom, organic and curved, with glass windows set in its sides like bulbous eyes.

Scott didn't understand her unhappiness. He loved their house, and all it stood for. It lived, at least in places, and even after being doused in a tailored poison it flourished, almost defiant. A tiny fiber of NuGro threaded across the kitchen window, seeking the sunlight, and Scott picked at it idly while he poured himself more coffee. NuGro stayed soft for a few hours after it grew and could be cut, molded, and manipulated.

Scott sat down and sipped at his mug. He would call the NuGro company, of course. The house was driving Linda crazy, that much was obvious, but it made him sad to kill it completely. He liked that it was alive, changing, dynamic. He wondered if the NuGro team could leave a section alive for him. There was a spot on the wall of the living room that bulged outward slightly; he was thinking about coaxing it to grow into a cabinet. Linda would like that. He had some ideas about the ceiling, too.

Outside, Linda sat on the stairs to the front door and smoked a frustrated cigarette, arms wrapped around herself. She was cold despite the sun: the early spring morning still held a breath of winter chill. The kitchen knife sat on top of a small pile of sad, limp, severed NuGro tendrils. She thumbed open her cell phone and called the NuGro company, setting up a time for them to spray down the house. No problem, they said. We'll take care of any unwanted growth. They'd said that last time, too.

She suppressed a shudder as she turned to go back inside. She showered quickly and dressed for work and the floor seemed to teem beneath her. If she stood still long enough, the NuGro would reach up and wrap around her feet, pin her to

the floor and crawl up her legs, cover her until she and the house were one and the same. NuGro infested the walls, insidious and treacherous. The door of the bedroom stuck slightly as she opened it to leave, and she pushed angrily at the tiny knob of NuGro that blocked it. She swore under her breath. Scott was in the bathroom when she left.

Scott's job started a couple hours after Linda's, so after she left he had some time to get some work done. He pulled on jeans and a plain t-shirt and mixed a glass of sugar water in the sink. What the NuGro couldn't get from the sun or the air, it could get from a little bit of sugar.

Outside, he smiled at the sun and the sudden burst of green that had accompanied the onset of spring. He walked around the house, poking it occasionally with his finger, feeling where it was still soft. The wall under a window on the front side gave slightly, and he pinched it gently, teasing out a little lump of NuGro so that it sat under the sun. He slathered it with sugar water, then left it and resumed his search. Linda had the green thumb, certainly, but he was a gardener of a different sort. He was growing a house: this spot here could be a porch, over here an enclosed patio, here, start growing out the foundation for another room.

One of the neighbors was getting the newspaper and she stopped to watch Scott's odd perambulation. Scott smiled and waved at her. She glared and went back inside. The neighbors didn't like the house-- it didn't fit in with the whole feel of the neighborhood, and he just knew they talked about it when he and Linda weren't around--but Scott didn't care. NuGro was the new toy of the age, the building block of the future, and Scott liked it just fine.

Inside, Scott began work on a corner of the living room. He had thumbtacked long pieces of string across the top of the room and doused them in sugar water. He wanted to create a fragile latticework across the ceiling that would catch the sunlight and reflect that tender NuGro glow, like passive lighting. Maybe Linda could hang a mobile from it; that was the kind of project that would get her excited again. She had seen the strings crisscrossing the room, he was sure, though she hadn't mentioned them to him. Unfortunately, the NuGro was not as enthusiastic as he was. It hung in a few loose strands down the walls, hardly clinging to the string. It probably didn't have enough sunlight. He wondered if the hardware store sold UV lamps.

Scott checked the time and realized he was already late getting in to the office. Reluctantly, he left his NuGro gardening and went to get dressed.

Emptied of occupants, the house sat, sandwiched between two-story modernist boxes. It seemed to sprawl in the sun, like a satisfied cat, a strangely incongruous backdrop to its green grass lawn and Linda's burgeoning garden. The neighbors on both sides had slapped up stereotypical white picket fences as soon as the NuGro building began to sprout, so the house seemed hemmed in on all sides, as if caged. The old couples walking to the park, the joggers on their days off, the dog-walkers, each slowed and stared when they passed. NuGro was something you saw on scientific documentaries, or prime-time ads for those new NuGro condominiums, or on a trip into Chicago, not walking down the street.

At some point in the early afternoon, a NuGro company van arrived. The first NuGro house on the block, they wanted it to make a good impression. The neighbors see the NuGro company caring, showing up for free maintenance, maybe they'll start thinking about NuGro houses themselves. You can't underestimate the power of word-of-mouth advertising. Three men got out

and unrolled massive tarps from the back, pulling out ropes and stakes. They worked quickly and in less than an hour the house was shielded from public eye, tented in blue plastic as if for fumigation. Then the back of the van spat forth gas canisters and the workers donned masks and long rubber gloves. The tent ballooned as the pressure of the bactericide under it grew. After, the workers sat down on the lawn and ate sandwiches, talking to one another with the quiet air of men who, long-acquainted, know each other too well.

Linda arrived home first, her dinged blue Honda pulling into the house's narrow driveway. She stepped out, unsurprised at the transformation of the house, and opened the trunk of her car. She shook off her heels and started pulling out bags of potting soil and terracotta planters of green shoots. Ignoring the workers, who watched her disinterestedly, she started planting tulip bulbs.

By the time Scott showed up, the workers were already wrapping up their tarps. All-in-all, killing the house had taken little more than five hours. Scott parked his Corolla slightly crooked behind Linda's car and stepped out. His hand shook, slightly, as he closed the car door. Just that morning the house had been made of potential: imaginary archways had shaded the doors and windows, the ceiling had split open to welcome skylights, a second story, a balcony and porch, medieval crenellations in marbled plastic, all growing quietly under his hand. Now it was a dead thing, no different from its neighbors but in shape. Before it had been a sculpture, a work-in-progress. Now it was nothing but a house.

"Hey, baby," said Linda, standing up as he approached, wiping dirt off her hands and knees. The spring days were still short, and the sun had begun to sink in the west. The shadows cast by the workers as they packed up their tarps and gas canisters were long and sinister, and the sticky molasses sunlight caught the few

sparse clouds in sharp relief. “I got that problem taken care of,” said Linda. “With the house. So it’ll stop growing now.”

“That’s great,” said Scott. His voice sounded strange and he struggled for a moment to keep it steady. He looked at Linda, at her face, streaked in dirt with her gold-brown hair falling soft over her eyes. She smiled, for the first time in months, it seemed, for the first time, almost, since they’d moved into the house. He smiled back, and she hardly noticed that his eyes were sad. “How are your gardenias?” he asked, and she took him in her arms and kissed him.

That night, while Linda slept peacefully beside him, Scott lay on his back with his eyes open. The house was dark and silent, like a cemetery at midnight. Of course it was always meant to be a house, just a dead thing, he knew that. But last night he had dreamt of NuGro towers, of sweeping vistas, of the coral reefs reborn on land, sparkling in the sunlight. Tonight, though, he had no dreams.

After hours of twisting and turning he got out of bed, dressed quietly so as not to wake Linda, and got into the car. The nearest all-night superstore was nearly an hour away, but he drove that hour happily down empty streets, humming along to oldies on the radio. NuGro wasn’t really available commercially yet, if you wanted to buy some you needed a special dispensation and a construction permit. But he knew where he could get some. He’d seen an ad online just that day. “The Young Scientist’s NuGro Playset!” it said. “Just add water!”

It was expensive, for a toy, but he bought four anyway.



About the Author

Zach Berkson is a Ph.D. student in Chemical Engineering at the University of California, Santa Barbara. His research focuses on exploring new technologies for sustainable fuel production. His other interests include urban agriculture, DIY electronics and crowdsourcing science.

LUCID DREAMS



AMBER-LEIGH ATTANASIO

LUCID DREAMS

by Amber-Leigh Attanasio

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ARIZONA STATE UNIVERSITY

I'm telling you, honestly. Look me in the eyes, check my pulse, do what you will. I'm having the time of my life. Every synapse in my brain firing at once. I can dream a thousand dreams and travel the world and back. As a matter of fact, I'm writing to you from the bay window of my bedroom, and you can bet your ass it is the most comfortable seat in the house. Looking outside, I can see the Great Wall of China. Behind it sits Mount Everest, the base of which is surrounded by the most beautiful beaches you've ever seen. Last night, I jumped out of this very window. Am I dead? Of course not. I'm not stupid.

Anyway, last night I jumped out of this very window and landed softly on the sturdy back of a St. Bernard. As he carried me to the ocean (which I decided was made of that delicious Ocean Water from Sonic), we spoke of things like what renovations I would make to my house and which celebrity I would sleep with this evening. As a matter of fact, I think it will be...

"Seriously, Alan?"

"What? I just thought you would like something for breakfast before I left." Alan was always doing this. Being himself. Being the most irritating man on earth. I locked up my loathing in the corner of my brain that only I can access and responded as any decent wife would.

"Thanks but no thanks. What are your plans for the day?"

“I told you last night. I have a meeting with the patent board. Cross your fingers. Today could be the day that our dreams come true.” As if.

“Yes, good, dear. I remember now. Good luck. Make me proud.” He bent over and kissed me lightly on the forehead. Just the weight of his arm on the bed made the entire frame creak, and I tried my best to stifle a groan. Nothing was as charming here in our dingy apartment as it was moments before he so rudely interrupted my slumber. In fact, nothing in reality was as charming as my dreams.

As he left, I thought to myself that if he found himself unsuccessful in this endeavor, he would find himself equally unsuccessful in keeping my attention. No. I couldn’t think like that. I wouldn’t think like that.

I attempted to shake these thoughts from my head as I walked to the dimly lit kitchen and opened the fridge. Great. We’re out of food. You would think that Mr. Everything would have this under control. I yawned and fixed myself a drink. One good thing about never eating a full meal was that alcohol hit me with more force. I sat down on the sofa, an old hand-me-down from my mother, and turned on the television. I should have known better than to even try. Since Alan spent all of his time developing his great invention that evidently wasn’t good enough to be marketed, we hadn’t paid the cable bill in over a month. Great.

I returned to the bedroom and flopped myself down, hoping that the force wouldn’t break the thing. I reached for the lucid dream-inducing mask that hung from the corner of the frame by my pillow and shielded my eyes with its darkness.

It was not long before I found myself able to control my life once more. Except this time, in light of my conversation with Alan, I decided to opt for a different life from that of my usual fantasy, flying, travelling, talking dog one. This time I

found myself on a sunny beach, hand in hand with Alan, whose normally ragged appearance was restored to the former clean-shaven glory it once held when we fell in love.

As I turned to the man next to me, my smile could not be contained. He looked at me without the sullen look of stress that had consumed him in the recent months of our lives.

“We’ve done it,” he stated simply. I swooned. I did love him. I really did.

Hand-in-hand we meandered up the bank, stopping periodically to admire a seashell or wash our feet in the sapphire water. The entire time, we could not contain our smiles as they stretched across each of our faces, each smile a sign of our appreciation for the simple company of the other. Finally we came to a beautiful, Victorian-style beach house on the rocky shore. We raced towards the house and straight into the bedroom where...

“Damn it, Alan.”

“Honey, I have news. Come into the living room,” he said with a mysterious look on his face. What the hell...

“This better be worth it,” I groaned in reply as he grabbed my hand and led me into the kitchen. We sat down on the couch, and he looked at me sincerely.

“I met with the patent board today. They said that I would be able to receive a patent, but I will have to find a company to pick it up and distribute it, and I don’t know how long that will take.”

I let this information sink in before I delivered my calculated response. “I don’t know what you want me to say. That’s fantastic, but it isn’t going to pay rent, Alan.”

The next few months were difficult to say the least. From that point on, Alan began to change. He shifted from his passion for his invention, and he picked up a couple of part-time jobs to pay the bills. I could tell that he wasn't as happy as when he was focusing on his true passion. But there was nothing that I could do about that. We needed to eat after all. Our relationship was rocky at best, with frequent arguments about trivial matters like money and time.

"I'm doing the best I can," Alan would conclude after most of these outbursts.

And the hard thing was that even though I knew he was trying, I continued to complain, and there was nothing I could do about that either.

I had become a woman possessed. My days were filled with fantasies about what would happen if Alan had been successful all those months ago. I couldn't escape it. I needed to live this life, but the only means I had to do so was the mask. I could put on the mask when I went to sleep, and I could finally gain control of my life. I became addicted to the control. I became addicted to the fantasies. I became addicted to the romance. I suppose people have worse addictions, but I've never known one to be so wrenching. I could not live in reality. I slept far more than any reasonable person would, but I couldn't understand why it wasn't okay.

It wasn't until one day, about six months after the patent incident that something finally broke the monotony that had become our new normal.

I was fixing myself a drink in the kitchen, when the door swung open and knocked the glass out of my hand. "What is wrong with—"

"We've done it!" Alan shouted. He picked me up and swirled me around leaving me dizzy and confused when he put me down and ran into the living room.

"Honey, today is the day that all our dreams come true."

“What do you mean our dreams?” I snapped. I was still frustrated at the idea of him swinging the door open so quickly without warning when he answered.

“I mean I got a phone call from Sharper Image today. They said they would buy the rights to the mask from me.”

“Are you serious? Oh my god do you know what this could mean for us?” My thoughts began to race. Everything was finally coming together. This is everything I’ve ever wanted and it was so attainable I could hardly believe it.

“Wait though. They gave me two options. Either they would buy it from me outright for \$1,000,000 today, or I could accept \$120,000 today and could continue getting royalties from them pending the product’s success.”

I couldn’t believe what I was hearing. For an inventor, Alan could be very stupid.

“So when do we get to move to France?” I asked nonchalantly. Surely he knew to choose the first offer.

“Well, actually, I was thinking that we could take the second offer. The starting money would be enough for us to buy a decent house somewhere, and we could finally have a steady income.” I guess not.

“You mean we could have a steady income if the mask is successful.” I replied simply.

“Well, yes.”

“So what happens if it’s not successful?” It was a normal question to ask! Was I the only one not thinking proactively here?

“Well I’m hoping that we won’t need to worry about that. Don’t you have faith in me?” I could hear the tension in his voice now. The tension that was so characteristic of our conversations over the past half of a year.

“Oh you’re hoping. I guess that we should just go ahead and do that then because you’re hoping it won’t turn out badly,” I retorted. I couldn’t help it. I wasn’t going to let him dangle everything I’ve ever wanted in front of my face and then snatch it away again as quickly as it had come.

“Okay.”

“What?”

“Okay,” he repeated. To be honest, I expected him to put up a bit more of a fight, but I guess logic hit him sooner than I had anticipated.

“Okay.” I smiled at him and ran across the room to meet his embrace. Finally.

The next three weeks involved a great deal of paperwork, cleaning, and preparations. We were to move from our apartment in Boston to a house precisely like the one of my dreams in Charleston, South Carolina. After Alan had signed the contract with Sharper Image, they mailed us a check, and we made a down payment on our new home.

Finally. I was getting everything that I had dreamed of...well, almost everything. Despite the fact that Alan finally had everything he could have asked for, he was still somewhat cold and distant. I couldn’t read him, but that was a book that I really didn’t have time to decipher. I was busy these days making arrangements for our future lives. Yes, planning. For once, I was not sleeping the dreams but living them. In some ways, it was almost better than the scientifically calculated lucid dreaming because the part of me that had felt some guilt about the

situation was removed. For once, being awake was better than dreaming. Not to be corny, but the mask had quite literally made my dreams come true simply by existing as the product of Alan's work.

A few more weeks passed spent in bliss, enjoying every moment. I was dressed in new clothing that usually was reserved for only the most elite. Alan and I could go out to dinner whenever we wanted, and, even though the conversation lacked zest, the food was consistently delicious. Everything was finally perfect. Finally.

"What do you think about getting another car?" I asked Alan over dinner one night at La Primavera, the fine Italian restaurant near our house. Conversation was lulling, and Alan had looked distracted, as usual.

"We can't afford it." Alan said without looking up from his plate. I froze.

"That's funny. Seriously though, I was thinking that we could get something a little bit nicer for around town. All the neighbors have nice cars, and it's weird to drive a Honda still. We don't want to ostracize ourselves."

"Seriously though, we can't afford it."

"What do you mean?"

"I think it's pretty self explanatory." I could hear it again. The tension. It had been so long since I heard it, but the memory of it flushed back in like it had been there only yesterday. "You're lavish. We're going broke. A million dollars can only take you so far."

He was being serious. "Well it was nice of you to tell me. You can't just spring this kind of news on people and expect them not to react. You know what, Alan? I don't even know what to do with you anymore."

“Well, maybe you don’t have to worry about that, then. I’m beginning to think that you don’t really care about me at all. I’ve spent forever trying to please you, and now look. We’re both screwed. So I hope you’re happy now.” And with that, Alan slammed the bill on the table and left. After staying at the restaurant for a few more glasses of wine, I finally walked home to find Alan asleep on the couch, wearing the mask that he knew well could allow him to control his dreams and find himself in a reality better than the one fostered by our currently hostile relationship. I should have wondered what he was dreaming about, but I didn’t care.

The following morning, Alan asked me for a divorce. I should have talked to him, but I was hung-over and I didn’t care. I should have apologized, but I didn’t care. I should have cared, but I simply couldn’t.

The ensuing months ate away at me. I had moved back into a studio apartment in Boston, and I was bitter as all hell. I was too stubborn to try to make things work with Alan, so when the time rolled around to work out the terms of the divorce, I didn’t even fight to take what Alan had earned. It was not out of my love for him, but for my own personal satisfaction that I would no longer try to take anything from that man. During my final meeting with my divorce attorney, I signed the papers, agreeing that the house and the remainder of the money that Alan had made from selling the mask was his. As I was leaving the office after signing the papers, Alan stopped me.

“I want you to have this. I know you need it more than I do.” He walked out of the revolving door of the reception area before my eyes could search his for some motive, some inkling of reason, leaving me with a small package that I did not need to open to identify.

I walked the two blocks from the brick office building to my dingy apartment with the haste of a relapsing alcoholic returning for the first time in months to his favorite liquor store. I navigated my way through the apartment in a trance and lay down in my twin-sized bed with the package. As I slipped the mask out of its brown paper packaging, I could barely contain my anxiousness.

I drifted off, and finally returned to the world I loved. The world where Alan and I looked at each other without hatred behind the stare. The world where we walked hand-in-hand and money didn't matter. The world in which we fell in love all those years ago. The world that the mask had built and destroyed. The world that I took and enjoyed without even knowing it.

And when I awoke, I was alone.



About the Author

Amber-Leigh Attanasio is double majoring in Psychology and Biology and Society at Arizona State University. She has always been passionate about writing and is excited to share in this endeavor with fellow fans of science and literature.



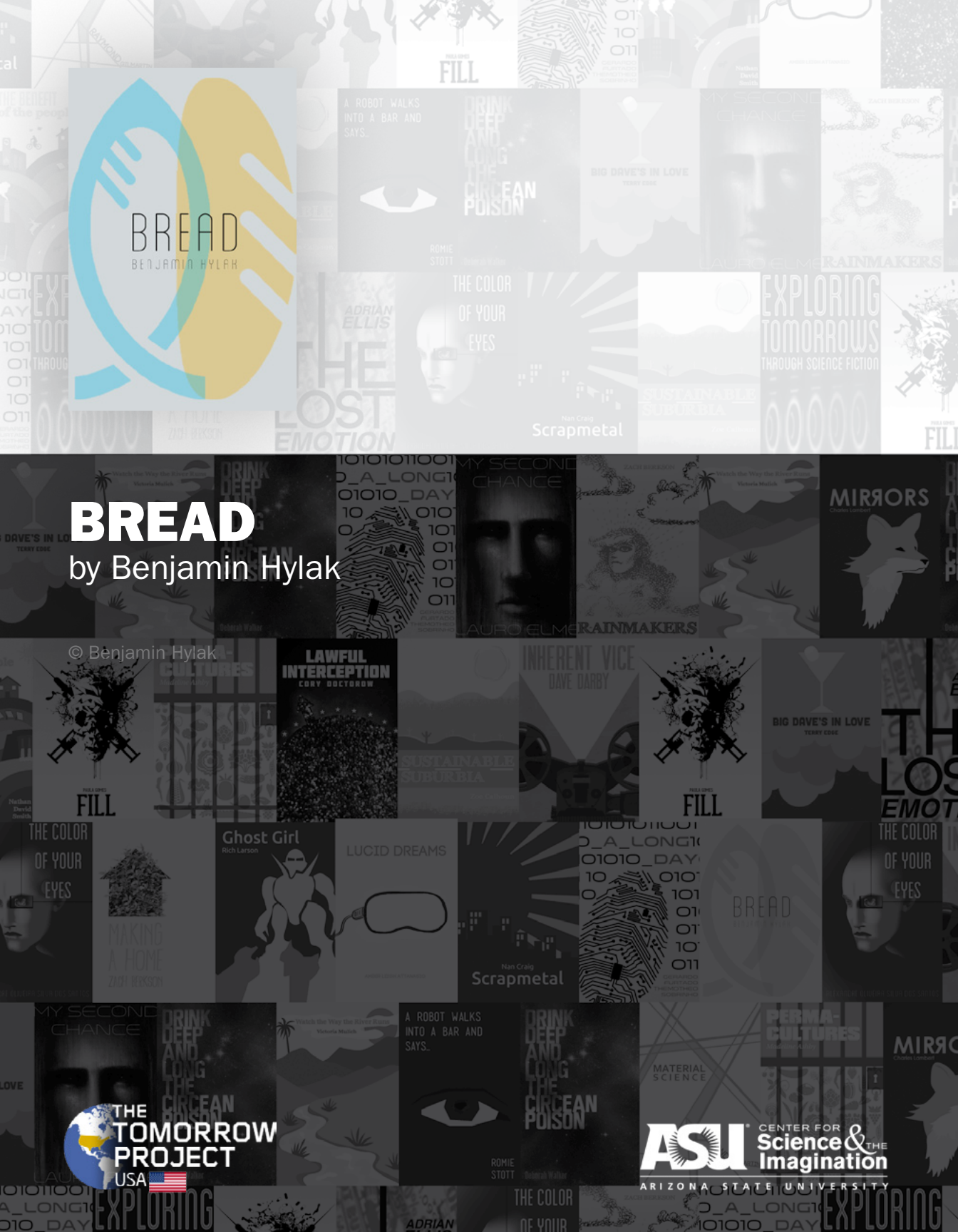
BREAD

by Benjamin Hylak

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ARIZONA STATE UNIVERSITY



CHAPTER 1

Matthew Simons stood anxiously in line on the sidewalk, his last errand of the long day, as he waited to pick up his daily earnings. Glancing down at his WristX, then back up at the clock hanging over the Teller window inside, he noticed he was three minutes off “official time.” An internal moment of panic ensued as he quickly synced his watch to the Bank’s. One could never be too careful with timing on a payday like today.

He looked around at the long stretch of line before him, then subconsciously bit his lip with worry. “Have I ever waited this long in line?” he asked himself. “Surely, I must’ve once or twice,” he whispered encouragingly, though he couldn’t remember any. Still, he managed to stay busy and focused as he waited, while his stomach grumbled in protest.

Minutes turned into hours. The line had barely budged. Matt surveyed his surroundings with concern. He noticed that the usual “Suggested Daily Menu” display at the Bank entrance was sparse at best, and contained only a few energy bars. He strained to peek inside the bank, and looked toward the cabinets inside, clad with bullet-proof glass, where daily “specials” were displayed. There wasn’t a single box of rice, jar of peanut butter or bag of crackers in any of them. The only food in the entire building, it seemed, was inside the Bank behind the doors, being dutifully attended to by the Teller.

Although Matthew maintained his composure, word of the empty display cabinets inside was spreading. Small fights started to break out – one person accusing another of cutting the line, and other trivial spats. There was not much camaraderie or “togetherness” in this bunch. Everyone was too hungry, and the wait was too long.

Still awaiting his turn, Matt stared wistfully at the imposing sign over the security-locked doors behind the Teller window: FOOD BANK. Years ago, as a young girl, his mother came to this same place with her mother for help, for a few boxes of cereal or rice that were brought there by churches or community service groups.

Fast forward to now, 2050, and this sharply-renovated “Food Bank” was not merely a service to the poor; rather, an account was a rare privilege of the rich, who were the only ones with enough excess to make “deposits” of canned soup, vacuum packed beef jerky, seed packets and rice for their future meals, for their grandchildren’s education or for their own employees’ wages. Like the vast majority of others, Matt came merely to withdraw his paycheck just as soon as his employer deposited it, as neither he nor his family had enough extra for a savings account or stocks. That withdrawal always involved a long, restless line and an even longer wait, while those with savings accounts entered through a secure side door—with no line...

A loud moan jolted Matt back to reality. He watched in horror as a teenager pushed an older man and knocked him out of line. Matt’s first instinct was to run to help, but he knew that if he did, he would lose his place in line... There was no mercy when it came to line breakers. Saddened by his own inability to help, Matt thought, “Could it get any worse?” but his question was about to answer itself.

As Matt was just about to pass through the scanner at the main entrance, a polite but obviously nervous-looking woman appeared. In a quiet voice that everyone eagerly strained to hear, she announced that the doors would be “momentarily secured,” then disappeared in a flash. A singular moan of agony and frustration overcame the crowd, as people protested in vain against the announcement. “Great!” Matt thought to himself. “This could take all day!”

Just then, Matt felt something fall on his shoulder and clatter to the ground. Looking down, he realized exactly what it was... a bullet. Relieved that no one else had noticed, his eyes slowly glanced up to the top of the four-story building across the street where he saw uniformed men walking, each carrying a long box. He instantly realized what was about to happen.

Like robots, the ten men must have all received the same command simultaneously; instantly, they all went belly-down and drew their weapons, just as an announcement pealed over the loud speaker: “The staff of Enlightenment Banking Corporation regretfully informs you that this location is currently out-of-stocks. Available reserves, including all energy bars, have been exhausted. Please remain calm. EBC will be re-stocked as soon as the government approves the next shipment of calories.”

“No energy bars?” Matt thought incredulously to himself. “There are always at least the energy bars...”

The announcement continued: “Side doors for savings account holders are also closed. Anyone with an active savings account should follow emergency procedures to access a portion of their savings.”

No wonder “account holders” were less and less common. Personal stocks were generally safest in private hands.

Matt immediately sprinted for his car. He knew exactly what was about to happen. Just like the first note of an all-too-familiar song, the ring of a nearby bullet reached his ear. The note was followed by several more that soon became deep, sinister chords, clashing harmonies from hell. Matthew reached his car just in time, shutting the door to evade a stray bullet. As he drove away, he heard more shots ring out, becoming ever-more-distant as he drove on. The screams, however, never left his head. They ricocheted back and forth in the dark chamber of his mind. What would they do now...?

CHAPTER 2

“How did we ever get to this point?” Matt asked himself. “Why didn’t anybody plan ahead?”

Of course, Matt knew the answers to his own questions. In an instant he heard the echo of his father saying, “When I was your age, son...” Matthew’s father would regularly tell him stories of how, as a teen, he worked in something called a “grocery store.” Just the description was enough to make Matt’s mouth water.

“Food used to be stacked up all around! Huge buildings full of food, any kind of food! Vegetables and fruits, meats and fish... Fresh and frozen foods, different colors, different flavors, you name it! All of it, right out in the open! You walked right through it all, took what you wanted right off the shelves—no locks and no display cabinets! You’d fill up your cart, and go up to the counter to pay—with money!”

Matt was only five at the time and asked, “Money? Daddy, what’s money? Is that like calories? Did you buy your food with calories? But that’s silly, daddy, buying food with food!”

“No, son,” his father began, with a serious tone. “Money was not like calories. The whole world had printed pieces of paper, or little metal disks, that were worth a certain amount, that the government kept charge of. Look here,” Matt’s father said, pulling out a coin. “This here, this was called a ‘quarter’, and you could buy a piece of candy with that! That’s money.”

Matt looked at the quarter with amazement, and asked, “May I have this ‘quota,’ daddy, to buy a piece of candy...?”

“It’s a ‘quarter,’ son, not a ‘quota,’ and you can surely have it,” his dad replied. “Hundreds, even thousands of those aren’t worth anything now—nobody will give you anything for that one, either... not any more...”

Matt put the quarter in his pocket, hoping his dad was wrong. Usually, his dad was always right; he was a respected scientist for years, with a PhD in nuclear physics. Still, Matt held onto the quarter with all the hope of a five year-old dreaming of a gumdrop. “Why can’t I use it, daddy? What happened to money?”

“Well, about five years into my grocery job, as I was working and going to college full-time, things started to change. There was a little less here or there on the shelves...sometimes, we’d run out of certain crackers, or maybe yellow apples ran out, then red...then all apples were out for a while...”

Matt’s father could see the confused look on his son’s face over the word “apple,” so he reminded him of the alphabet picture book, and the drawing that went with the letter “a”—“Remember, son?” his father said lovingly. “The juicy fruit I told you smells just like candy...?” Matt suddenly recalled the book and his father went on.

“Bread, well, as long as there was bread, we’d stay open. At least bread could get people through the day. But then...the Hunger came...” Matt’s father drifted off,

and seemed to stare into the distance, unable to continue. Matt remembered that his father became teary-eyed, tried to clear his throat, then just left the room. He never finished the story. The memory left young Matthew feeling very sad, so sad that a tear ran down his face, but he didn't know why.

Matt didn't know it then, but his father was referring to the Great Hunger of 2028, just five years before Matt was born. That year, things changed forever.

The Great Hunger of 2028, or GH28, lasted one month, two in some areas, and no food could be found except for what people had in their homes—or their gardens—before it hit. Rumors had been circulating for a while before it, and store supplies had declined alarmingly to the point that everyone could sense they were on a slippery slope.

Journalists sounded the alarm. Economists issued warnings. The government said not to panic. Most people tried to remain cautiously optimistic, distracted by the gadgets and toys of their daily, 21st century lives. The general concern, however, soon turned to a widespread panic as stores finally closed down in a huge tidal wave, with no sign of reopening in site, and with the last of their inventory looted by their own employees.

Shipments came to a halt, with stories of truck drivers who drove straight to their own homes to stock up on, or barter, their own cargo. The poor had little in storage, no money to buy anything, and no available credit to fall back on, as the Deep Credit Freeze had occurred the year before.

During GH28, even the rich found it difficult to get their hands on food, no matter what they could pay for it. Weekly food shortages—now commonly called “power outages,” as food, energy and power were all understood as one thing—became more common, even status quo, as the years went on. Families saved as

much food as they could to prepare for streaks without “energy.” But as soon as the power outages struck, many houses were looted and the food was sold on the black market.

Although the official explanation for the crisis was that food deliveries were delayed due to transportation shortages and trucking strikes, or that national disasters were affecting crop yields, people started to claim that the government was rationing the food sales to make it last longer. Some conspiracy theorists even suggested that the government was trying to kill the elderly and the young via starvation, but these claims were never proven.

It was no longer safe to store food in kitchen cabinets. That was the first place thieves would look. Instead, families began to protect whatever “extra” non-perishable food they owned in safes, and refrigerators were sold with locks.

Even that, though, wasn’t enough. Food was so valuable during power outages, and people were so desperate, that thieves would take entire safes at gunpoint, or blow open the locks on refrigerator doors. There was no place to hide.

Facilities such as the Food Bank, charged with keeping people’s accounts and stocks safe, were also attacked and robbed. At first, people simply walked into the bank to deposit their food. A list of “stocks” was kept in their name, which they could come back to claim at any time. This worked for a while, but as soon as thieves caught on, many people were killed on the way to making a deposit, before they could even get out of their car. Withdrawals were just as bad. It was too risky.

Afterward, the banking industry tried a pick-up service. For a fee, refrigerated, armored vehicles would make house calls to retrieve account holders’ food and deliver it to the Bank for deposit. This also worked for a while, but it became

too costly in pick-up service and storage fees for perishables. Nobody wanted to relinquish their savings in bank fees. The trucks soon stopped service.

Later, in 2032, the banking industry was turned on its heels, ushering in a change that would revolutionize the world economy.

A philanthropist banker, Lucas Economo, founded the Enlightenment Banking Corporation, or EBC for short. The EBC was a bank like no other, with its own philosophy, Board of Directors and monetary unit. Account holders could write checks, make deposits, have a credit card, and earn interest, but not a single dollar was exchanged.

The EBC's first branch and headquarters in Washington, DC, with its richly furnished lobby, oversized, walk-in refrigerators clad with golden handles, and cryogenic freezers layered in bulletproof steel, protected the new currency, the commodity of the day: calories. Wall Street's stocks were no more, replaced by stocks of grain and barrels of beans. Calories—processed through food “scanners” which automatically detected the caloric value and nutrition profile of any edible item—became increasingly difficult to obtain, and equally expensive. As it was no longer safe to keep anything but a single meal in one's house, the EBC forged a “neighborly partnership” with the federal government, and poised itself as the perfect solution to the world crisis.

To join the bank, a new account holder would contact the branch to arrange for a security escort. Entering through a private entrance, the new member would bring all the food he owned into the bank and place it on a long, metallic table, much like an operating table. A bar of blue light would then pulse slowly under the table, moving from one end to the other. The scanner would accurately calculate the amount of calories contained in the food, with a margin of error of

only .01%. The account holder's assets were thus duly recorded in calories, and he could draw upon the same for future need.

These initial calories became the "opening balance," as it were, for the new account holder. During promotional periods, new members also received a 500 calorie bonus, which in itself was enough to attract many new customers.

After being duly scanned and registered, the deposited food was originally kept on site, and exchanged as needed for other items of the same caloric value. Then the EBC got really creative.

In a press release claiming the bank was working to "increase profit on account holder investments," the EBC announced the new "Energy Bar" program. According to the new system, after proper scanning, caloric assignment and registration, all deposited food would be processed in a large machine that would chemically convert the food into energy calories, and then back into "energy bar calories," or EBC's, just like the acronym of the Bank. Vital nutrients were added as interest on the account. One bar was equivalent to 350 calories. Two per day and an average-sized adult could survive. Three to four bars per day constituted a minimum US RDA for the year 2040, depending on a person's height, and at 5+ bars per day, an adult became part of the upper middle class, those with a BMI of 18% or more, the "Energized."

At first, the government refused to officially convert to the calorie system. However, as more people opened up accounts at EBC and used Energy Bars as currency, federal resistance to the economic change didn't matter. Employers started to pay their workers with calories, with the unofficial minimum wage set at 230 calories an hour. A hefty wage for a dedicated employee could be about 390 calories an hour, or more depending on seniority. The minimum wage

allowed most people just enough for the daily nutritional needs of one adult and one child. Extra calories—for necessities such as rent and heat—often had to be earned, or acquired, by other means.

Retail establishments were next to catch on to the new currency. Soon Enlightenment Banking Cards were accepted at most locations. EBC then began allowing transfers of dollars to calorie deposits at an exchange rate of 4.5 cents per calorie. Soon, EBC was the only bank left standing. Naturally, the government jumped in on regulating the currency, but they could do very little to control it. EBC was the new Treasury Department, the Fort Knox of 2040, with currency in bars of calories, instead of gold.

It was the only currency Matt had ever known.

This system continued for years. However, as the value of the calorie steadily increased, workers were paid proportionately less. Still, people worked, the system worked, and people survived...until the Great Outage of 2048 hit.

It was known that a power outage was just over the horizon. Hurricanes had become more frequent due to global warming and increasing water temperatures, so it was no surprise when a hurricane was forecast to hit the East Coast.

Detected in the Atlantic Basin, Hurricane Aeolus was 1400 miles in diameter, the largest ever recorded. Many people rushed to purchase emergency supplies and food. Others worked to secure their homes and what little they had, while thousands were advised to evacuate.

Many EBC customers began to line up at the bank to withdraw several weeks' worth of calories—primarily in the form of the flavorless, 350-calorie bars... For a couple days, things proceeded normally. Then, to everyone's shock, there wasn't

enough. People were sent home from EBC after being told the doors would be “momentarily secured”—that horrible, EBC pat phrase so skillfully packaged in politeness that rang out all too familiarly in Matt’s head. Officials urged the public not to panic. Unfortunately, with an impending hurricane and no food, panic was the only natural reaction.

It slowly came to light that EBC had traded and invested millions of calories in foreign markets, “with promise of a sizable return on investment” according to official EBC reports. Only a small percentage of account holders’ actual assets remained stateside. On paper, things seemed to be in order; calorie deposits were intact, and interest seemed to be accruing. In reality, the last of the energy bars had been traded. The EBC couldn’t create calories from thin air. “That’s God’s job,” one Overly-Energized VP quipped to the media, only to be dismissed by EBC officials the next day. “Perhaps his hefty BMI will now return to within average limits,” retorted one journalist who had interviewed the pompous banker.

Matt was 15 at the time, and already responsible for his family’s care. After gathering any available supplies he could barter to prepare for the hurricane, Matt found himself in and out of consciousness from hunger and exhaustion, with one particular event standing out.

Driving back from a supplies run just days before the hurricane, he was jolted from an exhausted daze upon hearing a horn blow and tires squeal, only to find himself weaving into oncoming traffic. “Present moment, present moment!” he said to himself, grateful to have escaped a tragedy...or was he? At that moment, a new thought crossed his mind, something he’d never felt before. Was he really grateful to have avoided the collision? Things were getting worse day by day. Living was an unbearable burden. Now, with a hurricane coming and no

available calories to withdraw from the bank, Matt couldn't imagine how he and his family would survive.

Arriving home, he knew he would have to tell his family the news about the bank doors being "momentarily secured"...yet again. Fortunately, he didn't have to say a word. As he walked in carrying the biometric food box low and by his side, Matt's sisters rushed toward him, but stopped when they saw his face. They had experienced energy outages before. The girls' faces turned grim and, already aware of the need to conserve energy, they walked rather than skipped away. Matt's mother also sighed, anticipating a week or more of starvation. But his father, lying in bed, caught Matt's eye. He seemed to understand.

Matt looked at his father again. Yes, he understood. The Great Outage of 2048 wasn't just another power outage. Today's announcement wasn't just another "momentary" delay. They were on their own for real this time. Everyone was on their own. Living would be a day-to-day struggle for sustenance and survival, just as it had been at the very beginning of time. The Great Outage brought to light a whole new reality: EBC was not reliable. Stored calories and deposited stocks had been usurped. They just weren't there. People would lose their homes, their futures, and even their present because of the greed and gluttony of a few CEOs and careless, fat investors.

Hurricane Aeolus came and went, fortunately with less physical damage than anticipated, but with emotional and economic impact soaring out of control. Trust in the economic system was slipping, and so was hope. For the time being, EBC recovered public faith with federal aid and a lot of promises. Energy bar stocks were replenished, and bank window displays of daily "specials" reappeared, though they were rarely available for withdrawal.

People were starting to look over their shoulders. Someone had to do something, and soon, or the world simply wouldn't survive.

CHAPTER 3

Matt awoke to cries of terror. He shook himself almost as if he was trying to shake the noises out of his head. "Am I Imagining this?" he thought abruptly. "Is this a dream?"

As his eyes opened, the cries for help persisted. He heard men's voices downstairs and his mother crying. Matt knew exactly what was happening – they were being robbed. He reached under his pillow and retrieved a pistol, originally his father's, but his since age 11. "You're becoming a man now, son," his father had said, "I need you to help protect the family." Matt ran downstairs and cocked his gun, taking aim at the robbers. As soon as he made up his mind to shoot, he was shocked by what he saw. One of the robbers, who stood in front of Matt holding his mother at gunpoint, was none other than Matt's 7th grade teacher–his favorite science teacher at that.

Matt aimed the gun, but he couldn't fire. Thoughts of happier, creative times spent in the classroom, in the science lab and side by side with this incredible instructor filled his head. The ammo was in the barrel, the gun was cocked, but he couldn't pull the trigger. He just didn't have the will power.

He aimed, pointed the gun with a hand shaking, then locked eyes with his teacher as he watched him stuff a duffel bag with all the food the Simons had left in their house—a mere six energy bars. The teacher looked distantly at Matt, with an almost unrecognizable glimmer of the hope that had once filled those curious, energetic eyes. Matt cried, then screamed, but his parents understood. How

could they have expected their son to shoot his teacher? Looking at his mother's gaunt face, and his little sister's sunken-in stomach, Matt vowed that next time, teacher or not, he would do what he had to do.

With no food left, Matt had to search. It'd been almost a week now since the long wait on the sidewalk at EBC, and the announcement hours later that the doors would be "momentarily secured," followed by gunfire... Matt's family, and many others, were completely without food, with no word on when the government would "approve the next shipment of calories."

Matt tucked his gun in the back of his pants and pulled his shirt over it. He walked through towns, and from a distance, things seemed quite busy, almost normal. He heard noise, saw cars and people. He was happy that he'd at least be able to see his friends. He longed to talk to kids his own age.

Matt made his way toward the center of Queens, particularly the bottom of an abandoned subway escalator. Local teens always gathered there. Despite its dingy, unwelcoming appearance, kids would sit, talk and gossip there for hours. Matt was looking forward to it.

As he approached the escalator, a different scene, far from what he was imagining, took shape. A limp body on the sidewalk—a man who had clearly died of hunger—blocked the escalator path. At maybe 50 or so, the man had business clothes on, a suit at that, and was clean-shaven—but his face was sunken in, like a skull with a thin film over it. Frightened, Matt turned away his gaze.

He continued on. A different, more sinister site came into view. As Matt got closer, he saw trucks being loaded with bodies, and people wailing over loved ones in the middle of the street. He strained to see a certain detail that he was dreading to confirm...from a distance, he saw Jed, his best friend from eighth

grade, motionless, in the middle of the street. He turned around and headed straight for home, running to erase the memories.

Once home, he quickly stepped on the BMI Calculating Scale – still 17.9%. He was just under the Energized Class, but he wouldn't tell anyone – just like he wouldn't discuss anything of what he'd seen. In the morning, he would find food. There was no other choice. His family needed him.

CHAPTER 4

Matt woke up excited and full of energy. Then he stopped himself for some reason, he had the foolish idea that it was a school day. “It must have been a dream,” he said, sitting down on the edge of the bed. “Who would've thought I'd ever miss *that* place?”

Matt never particularly loved school, but he did enjoy a few classes, especially science. What he truly loved was solving problems and the relaxation that creative energy gave his mind. He'd pay a million calories to go to school again, without the constant worry of how to feed his family. Funny how things change...

Matt sat down and put his WristX on the table. He had to find food. “Why can't I just steal it?” he thought. But deep inside, he could never bring himself to do it. He could never put anyone else through the same trauma and misery his own family was living. He decided to use his brain to come up with a solution.

As he drifted into a daydream, he noticed a small beam of light that made a very bright spot on his table—and then it clicked. Filled with excitement, he rushed downstairs and pulled out a small green bin of parts. Circuit boards, screws, bolts and motors flew in every direction until he finally found it: a small digital scanning calorimeter. It was part of his 6th grade science project, one

which earned him an “A”... There were still a few flaws, however; the calorie counts were off, and the scanning distance was limited...it was time to make those adjustments.

Sitting at his desk, he grabbed the magnifying glass, then hit it against the table until it shattered. He very carefully removed a small sliver, which he put in front of the calorimeter scanner. After charging it for a while, he flew downstairs and out the door before his mother had the chance to remind him to drink his water for breakfast! Matt then flipped the switch, and a very bright blue light projected outside onto the sidewalk...but nothing happened. The screen didn't turn on, and the speaker emitted only a low hiss. Disheartened, he started toward home, his arms swinging back and forth, when unexpectedly, he heard a beep. The screen turned on and said “4cal”. Matt looked down at where the blue light had landed, worrying that this was just a fluke, but lo and behold, under the blue light stood a single bean on the sidewalk. The blue light reflected off of it, as if in a triumphant declaration of victory.

He slowly picked up the bean and inspected it, then immediately ran home, right back into the kitchen, to proudly show his family the amazing, scientifically-discovered bean!

His family was unimpressed.

“You got lucky,” little sister Katy said. Matt decided to ignore the comment. They were tired and hungry. He'd been there many times and he knew the negativity and hopelessness that hunger created. Matt was the only one who seemed to be able to think clearly these days and he decided to be grateful for it. Undaunted, he sought to prove the bean wasn't just luck.

Matt walked deliberately through his neighborhood. With all the optimism of an informed scientist who bases his hope on irrefutable facts, Matt brought small plastic bags with him to store the “discovered” food he hypothesized would be there. That hypothesis proved correct as he found many dropped beans in unexpected locations, followed by nuts and an occasional small pile of spilled grain. By the time he was done, he had filled over eight plastic bags!

Just as he was about to return home, he noticed something: a small, rundown, wooden house on top of a hill. Houses hadn’t been built out of wood for at least 30 years, as most were torn down in the 30’s because wood was looted right off them for heat and cooking. Matt found it very intriguing to see one in that condition.

Besides being built of wood, there was nothing unusual about the house. “So what exactly is so interesting about this place...?” Matt asked himself.

He stood there for a while, unable to answer the question, and just looked up the hill. He noticed its shape and structural integrity. He liked how warm and welcoming it appeared to be, or to “have been” at one time. There was an energy about the place that seemed appealing, magnetic. Still, he couldn’t figure out why he was so attracted to it. He kept asking himself that question, as if in a daze, even as he proceeded up the weedy, cobblestone walkway to the front door.

It was obviously abandoned, but still somehow seemed cared for. He knew he had to go in. When he reached the front door, he paused. He was filled with a wave of fear, expectation, and curiosity. He slowly turned the knob and mustered every drop of courage he had to pull the door open...but it remained shut tight.

He then pushed the door in but was met with the same result. His eyes drifted downward to the creaky, wooden porch where he noticed a small, black box

partially hidden by leaves. As he cleared them away, he was able to decipher the words, “Gift From God” engraved on the lid.

As he picked up the box, it popped open in his hands. Resting upon the red velvet interior was a small, golden key. More mystified than ever, but somehow driven by an internal sense, Matt tried the key in the door. Smoothly and without effort, it opened before him.

Matt proceeded cautiously inside and slowly digested what he saw. He felt like he’d jumped back into a 150 year-old photograph. The Victorian style furniture, lightly painted walls, a rug in the center of the room made the room look identical to photos Matt had seen from the early twentieth century.

Matt took out his calorimeter and decided to begin searching for food. He moved cautiously at first, clearing cobwebs from overhead. As he walked from one side of the carpet to the other, he suddenly heard a loud crack, and before he could evaluate the situation, he was falling ten feet onto a cement floor below.

He shook himself off and checked for injury, but seemed fine. Dazed but undaunted, he conscientiously asked himself, “Now where’s that battery pack...?” Once he found it and powered up the calorimeter, it started beeping incessantly. “Oh great! My calorimeter is broken! The only way it would be beeping like that is if this house were *full* of edible calories!”

Matt’s eyes then focused on the blue line of light the calorimeter was projecting. With a tap of his wrist, the room was illuminated by bright lights coming from his WristX. Confusion, fear, excitement: Matt felt them all simultaneously, then he suddenly became light-headed. He attempted to sit down, but instead fell to the ground.

CHAPTER 5

Regaining consciousness, Matt looked around the room. He couldn't believe his eyes. Surely this must be a dream! An entire tank stood in front of him. On one side was a counter on which a loaf of bread rested. "I haven't had bread since I was seven..." Matt thought to himself, while memories of the aroma, flavor and texture of his last slice made his mouth water. As he approached the counter, he noticed a note that read:

Dear Gift from God,

By now, a fresh, wholesome loaf of bread such as this will surely command attention!

You have arrived not by accident, and you have two options. You may take this succulent loaf of bread and a selection of freeze dried food from the solar, cryogenic freezer and tell no one. Enjoy one fine meal with your family, and forget you were ever here. Choose this option, and leave at once.

Or, you can change the world. Choose this option, and do not touch the tempting bread, but rather, take the nearby bottle labeled Growth back to your home. You may also take whatever calories you find here today for your family's nutritional support. Then, turn this paper over and begin the needed research.

Do not doubt that you can change the world. The decision is in your hands.

Lucas

Matt instantly knew which option he'd choose. Despite the tempting aroma of what seemed to be very freshly-baked bread only meters from his nose, he flipped the paper over and saw schematics – mechanical and electrical designs with words he couldn't understand. He folded them hastily and put them in his bag, while thinking, "What's this 'Gift from God'? What does 'Lucas' want?"

He put the food into his bag, and carefully placed the bottle of Growth in a side pocket. He then used a nearby rolling ladder to reach the top floor. Before he left, Matt readjusted the carpeting over the hole. Taking one more look around and a deep breath of musty air, he walked out the door, dutifully locking it with a shiny gold key he now called his own.

CHAPTER 6

"911. What's your emergency?"

"My son! He's missing! Please send out an officer unit!"

"Location noted. A pod has been dispatched."

click

Fifty-eight seconds later, a Police Pod arrived. Police Pods were unique vehicles. They traveled at speeds of up to 1000 mph and 20 feet above ground. The police officer walked to the door and raised his visor. "What's the emergency, ma'am?" he said, peering into the house.

"My...son...! He's...gone!" Matt's mother said, trying to keep from fainting.

"Can we come in, ma'am?" the officer asked.

"MY SON'S OUT THERE!"

“Ma’am please sit down and try to remember the details....”

Matt’s mom motioned toward two chairs in the living room. Once they sat down, the officer proceeded, “Ma’am, if you supply your son’s ID, we will generate his most recent digital photo from archives. We will then transfer it to the employee chips of every street crew member on duty for tomorrow’s clean up. They’ll look for him as soon as they report to work.

“As you may know, ma’am,” the officer continued, “we’ve unfortunately been seeing many sudden, unprovoked deaths lately, especially among the elderly and children. We will do all we can. I’m deeply sorry for your–situation.”

Just then, Matt busted through the door, his sack in hand. When he saw the officer, he instinctively ran upstairs without hesitating. He was carrying a sack of food! It would be considered stolen and then be confiscated. He could even be prosecuted! “Where can I hide this?” he anxiously asked himself. Just then, the lights went out.

CHAPTER 7

Matt heard the officer rustling around downstairs. He instructed Matt’s family not to move as he looked outside. The entire neighborhood’s lights were out. A mask of panic and fear swept over the officer’s face, and he suddenly left for his patrol car. The family’s lost–and apparently found–son no longer mattered.

Momentarily relieved that his sack of food was safe and sound, Matt’s next thought was his father, who was hooked up to an RLA (Robotic Life Support) unit. The device was a small, 3x3 board implanted between his father’s brain and spine. The RLA regulated hormones, blood supply, oxygen levels, and all his body’s vital functions. Matt was too young to remember when his dad had

the RLA implanted, but he did know why. His father was protesting against the calorie system, though he used to be one of its strongest proponents. He had once worked for EBC, holding the position of Vice President, and was a valuable scientist and VP, next in line after Mr. Lucas Economo himself!

Matt's dad gradually began to recognize the flaws in the system, and the impending abuses. When the Energy Bar program was announced as a bank "breakthrough" in 2035, the determined, ethical scientist quit his job and became part of the Rebel Movement. Tensions flared.

During what was supposed to be a peaceful, city-wide protest, firing by EBC guards unexpectedly broke out, for which the EBC never claimed responsibility.

Allegedly ordered by "upper management" to fire blanks at any protestors within 20 meters of the bank, something went fatally wrong, according to official EBC court testimony by one security guard. Many of the guards' weapons "somehow" had their blanks switched with live bullets, resulting in the sudden massacre of many peaceful protestors and innocent bystanders. Was the shooting an accident? Who had ordered weapons to be drawn? Who had "replaced" the blanks? No one knew for sure, and with very little cross-examination by the state-appointed public defender, court proceedings ended with a favorable, "not guilty" judgment upon the defendant, EBC.

The ruling itself made many things clear: EBC was the government. EBC was your mother, your father, your next calorie. Do as EBC says. Do only as EBC says.

Matt's father said he wasn't surprised by the ruling. "That's why I was there in the first place," he resolutely told the media upon his discharge from the hospital as the "only survivor" of the massacre. Indeed, his survival and recovery were both deemed "miraculous", no doubt due to three emergency

surgeries and a successful RLA implant by a well-known surgeon who was his Stanford roommate in graduate school. “I’m lucky he insisted on performing the operation,” Matt’s father also told the media, “or I wouldn’t be surprised if another ‘accident’ had occurred on the operating table.”

Though the RLA kept Matt’s father alive, he was certainly never the same. “But I can think the same,” Matt’s father once consoled him, “and that’s the most important thing we have—our minds, our ideas, our decision to solve problems and make life better for others...”

Those words of strength filled Matt’s mind as he rushed to his father’s bedside, and wondered how long he could he make it without electricity...

His dad didn’t seem surprised or disturbed. He lay there, an introspective smile on his face, then slowly turned toward Matt. “I’m proud of you son,” he said. “You’ve been a gift from God. You have a good head—use it. It’s all in your hands now, Matt...”

Before Matt could respond, his father’s eyes moved slowly toward the ceiling. He was clearly still aware, but from experience, Matthew knew that the conversation was over. He kissed his father’s hand, then placed it comfortably on his stomach where it remained motionless.

Matt knew he had to get back on track. Despite his father’s own drastic situation, even he was urging Matthew on. He went up to his room and brought down the bag of food. When he showed it to his mother, she immediately slapped him, exclaiming, “How could you? Don’t you know the penalty for stealing? They’ll kill you! You know our rule: Survive with honor or die with honor. I DIDNT RAISE YOU THIS WAY!”

Matt took his mother's hands and pleaded with her to calm down. He showed her his calorimeter, then explained what happened at the house. When he mentioned the house, her face turned pale. "Mom, do you know anything about that house...?"

His mother hesitated, looking for words. "Nothing, son, nothing at all. I'm just surprised you went out of our neighborhood. You've worked hard today, son. Because of you, today we will eat." In her voice was a tone of nervousness and concern. Perhaps she didn't believe his story; perhaps she still thought he had stolen the food; or perhaps there was something she wasn't saying...

CHAPTER 8

Matt heard the joyful clatter of dishes being taken out of the cabinet. How long it was since he'd heard that sound! Years ago, the noise would have been taken for granted, another note in the symphony of life that went unappreciated, but today, it reminded him of a skilled violinist performing a solo for a packed audience. The music of the dishes, perfectly accompanied by the silverware being taken out of the drawer, mingled together like the first introductory notes of an orchestra tuning their instruments. Tonight's performance would be spectacular! The symphony of an upcoming meal was about to be savored!

After dinner, Matt was applauded. His father—now resuscitated and temporarily supported from "emergency" electricity supplied by city generators to the elderly and handicapped – smiled at him, a sneaky smile in a way. "Remember what I told you, son..." his father said with a kind look in his eye. His sisters Marissa and Katy ran to hug him and clung to his leg as he left the table. Back in bed, under the covers because of the constant chill in the house, Matt thought over the day.

He still didn't understand it. Perhaps it was just a dream? No, he thought. His stomach was full and satisfied; this was no dream. He thought about the box, the key, and those words, "Gift from God" on the lid. Was the key the gift? The food? Was it a person? A thing?

Bigger questions came to mind. Why had no one looked there before? Almost every house in the area had been robbed, abandoned or burned down, but that one was intact? Unable to sleep, Matt researched what still confused him the most, the words "Gift from God" on the box and the letter. He tapped his WristX and commanded, "Search for word string 'Gift from God,' all results."

Hundreds of options appeared, everything from jibber-jabber religious rants, to conspiracy theories, from historical accounts of religious figures he had only vaguely heard of, to people claiming to be "on the dark side". Really, this wasn't helping. Just entering the word "God" made things way too complicated. Everyone seemed to have an opinion, a hope, a doubt, or an insult.

Then something caught his eye: Matthew. Maybe it was just the banner heading on a page he'd accidentally accessed, but he had to make sure. He scrolled up and found a page titled:

"Name Meanings: Results for: Matthew = Gift From God"

The confusion increased. "Matthew means 'Gift from God?'" he wondered incredulously.

Why was the meaning of *his* name on the box? Why was the letter addressed, indirectly, to him...?

"Was it all just an accident?" Matt thought to himself. No, the letter said that it wasn't. "But I've never been in that house in my life!" he thought. He didn't even

know who owned the place, which immediately became his next line of business. He needed to find out whose house he'd been trespassing in.

He searched for the address, but found no result. He then looked at a satellite-generated map on his WristX, as supplied by city archives, updated dynamically every 60 seconds. He panned over to where the house was, forward and back, noting nearby landmarks. "It has to be here," he said to himself, still scrolling over the aerial photo... but nothing was there. The only thing he recognized was a flat area of grass right where he felt the greatest "pull" of that unexplainable energy, or whatever it was – where the cobblestone walkway had begun...

"It's just gotta' be there!" Matt blurted out in frustration. "At least, it was there..." He didn't know what to make of it, or how to understand. His father had taught him to approach things critically, to gather data and make reasonable conclusions based on information. But his data was too scattered, and the numbers didn't add up. In fact, the numbers weren't even there. He felt confused and disappointed. "I need sleep," he stated. "I just need sleep..."

Sleeping was his favorite part of the day. In his dreams, he ate.



Matt sprang up from bed. Like the undesired replay of a recurring nightmare, he once again heard commotion downstairs. They were men's voices this time, and more than one. He heard his mother and sisters crying. "We're being looted again," Matt thought.

He grabbed the gun from under his pillow then ran downstairs. As he aimed deliberately, an unexpected sight greeted him. A team of four REDs (Robotic

Emergency Doctors) were attending to his lifeless-looking father. The next thing he knew, they were placing his father on a stretcher. They continued to check for vitals, but the monitors showed zeros across their chest screens. The REDs looked up at the gun being aimed at them and froze. Matt had forgotten he even had it in his hand. His face flushed with anguish and hot tears, as he attempted a polite “I’m sorry...” under his breath, then ran back to his room.

“Now I’m really alone,” he thought. “Everything is on my shoulders...” At that moment, grief set in. Starvation was nothing compared to this.

His mother came in and tried to console him. “At least he died with a full stomach,” she said, “and very proud of you, Matthew. He believed in your mind, in your ability to solve problems. Somehow your father—the critical thinking scientist that he was—always thought you’d be some kind of prodigy, someone who’d help the world somehow... Even when I first told him I was pregnant, he put his hand on my stomach and looked like he was praying, he had so much gratitude on his face... Then he looked me square in the eye and said, ‘This one is a gift from God’...” Her words hit Matthew to the core. He couldn’t contain his sense of grief and yet hope, the juxtaposition of the heavy burden upon him at such a young age and the excitement of potential for resolution. He fell into his mother’s arms, sobbing wildly. Then she kissed his head and rocked him until his tears subsided.

Matt didn’t know how he’d continue. He didn’t have the strength to console his family right now, but yet, he managed a quick visit to his sisters’ room, where he hugged them tightly and assured them, “It’ll be all right—daddy wants me in charge now...” He then put on his favorite black jacket and left the house.

He walked to a favorite spot, Bryant Park. Buildings hundreds of stories high towered all around, but a certain spirit of the park nonetheless remained, like the familiar smells and rituals of an ancient religion. People didn't stop there much anymore since the grass was gone. During times of drought, farmers had come and stolen whatever grass they could get their hands on to feed their animals. It was a desperate attempt to keep one or two head of cattle alive.

A few people even tried making a meal of the grass, cutting handfuls with scissors then pressing it into "green juice" or boiling and eating it back at home. As soon as the city heard, they sprayed the grounds with pesticides that removed the nutritional content. That stopped the farmers and the looters, but also killed the lawn that was now a dirty, rocky shadow of its former self.

Around him, people still seemed to move more quickly than ever. This was a privileged part of town, and the energy was palpable. It perked up Matthew's spirits.

Only the rich worked here. They walked about in their expensive suits, each worth at least 20,000 calories. This was the heart of the Satisfied District, where BMIs rarely fell below 20%, and where his family used to live. Matt had just a few memories of his early years there, mostly pleasant smells and flavors that came to mind at the most unexpected promptings.

Matt liked watching how smoothly everything ran here. Unexpectedly, a girl with brown hair and brown eyes sat down next to him. After a few minutes, she said, "My name's Sofia," while looking straight ahead.

Temporarily forgetting his worries, Matt managed a smile and said back, "My name's Matt."

"That's a boring name!" Sofia said bluntly.

“Oh, it is? Do you even know what it means? It means ‘Gift from God.’ But since you don’t like it, I’ll be sure to contact the Naming committee and have it changed!” Matt replied.

She giggled, a real giggle from her stomach, and said, “I’m sorry, Matthew. I like your *whole* name, all of ‘Matthew’, just not the ‘Matt’ part...”

Hunger, fear and grief were suddenly unimportant. Matthew and Sofia talked for hours, and their gazes periodically changed focus from the hustle and bustle around them to each other. “Want to get something to eat?” she said. Matt laughed, assuming she was joking, as he was getting used to her sarcasm. She looked at him laughing, then just stared, confused.

“I’m sorry,” Matt explained, “I’d love to get you a sandwich and talk more, but I have nothing to trade, not a single calorie on me...”

To that Sofia promptly replied, “Follow me.”

She walked a few blocks up to a high-rise building nearby. Entering a small pod on the side, they scaled up the building like a rocket to level 882. A blue light passed over Sofia’s face. “The light brings out your freckles,” he said, “and they’re kinda’ cute, actually...”

Sofia shoved Matt against the glass playfully, and they continued into the apartment. He was shocked by the sight, just like the archives he’d seen of his father’s high-rise office at the EBC. She walked into the kitchen and opened the refrigerator. There were meats of every variety, milk, vegetables, beans and rice, eggs, and even desserts that Matt had never tasted, but only read about. She offered him one of everything. “Go ahead, Matthew. It’s fine, we get restocked every week. My dad works for a law firm which runs its own Guard-en. We can take as much as we want!”

Matt was amazed but simultaneously disgusted. “When’s the last time you had a power outage?” he asked.

“A power outage? Oh yeah, I remember that. I was like three. It was only two days, but we had enough saved up. What about you?”

“We’ve had a power outage for almost two weeks now...didn’t you hear about what happened outside the bank... the shooting...?”

Sofia couldn’t believe her ears. “Two weeks? A bank shooting? You mean at EBC? No, I didn’t hear...I mean, I knew there were outages...but two weeks? How do you survive? Where do you live?”

“About three miles from here, in Flushing, Queens. And we don’t survive. We die eventually. We’re all dying...like my father did this morning...”

Sofia’s eyes filled with tears. It meant a lot to Matt that she seemed to care so much, though he couldn’t figure out why. She filled Matt’s canvas bag with supplies. Suddenly, the pod elevator dinged to announce someone’s arrival. Sofia’s father exited the elevator, only to see Matt standing there with his daughter. He walked toward them slowly, his head half-cocked with a stern look on his face.

“Hello, young man,” he began in a slow, serious tone. “I don’t believe we’ve met. What’s your BMI?” Sofia’s father asked, getting right down to a question of net worth and, in essence, cutting to the chase of what most Satisfied Class fathers cared about most.

“17.9%, sir, and on the rise,” Matt said, remembering the meal his family had enjoyed last night, courtesy of “Lucas.”

“You’re barely part of the Energized. Furthermore, we have a strict policy of only admitting the Satisfied into our home. You have 60 seconds to exit before law enforcement is called...”

Matt became nervous, and looked to Sofia for help.

“I said 60 seconds, young man, but first, reveal the contents of your bag.”

Sofia interjected before her father could approach. “I gave him food, father! His family is starving!”

“Where does it end, Sofia?” her father said, rolling his eyes. “Will you feed the whole country? Son, if I see you so much as glance at my daughter again, I will have your national registration number terminated immediately!”

The threat did not fall on deaf ears. Matt had no doubt Sofia’s dad could carry it out. Having his national registration number “terminated” would mean, in effect, that he would disappear from every database, and would no longer qualify for a single calorie.

“Sofia, we will talk later!” her father continued. “Twenty-six seconds...”

Matt ran for the elevator pod. From such a high vista, Matt could see the entire city. He saw the exact line dividing the rich from the poor: the quick moving lights and energy on one side, and the apparent lethargy and sadness on the other. “People there simply don’t have the energy for anything,” Matt reasoned, “because it’s all being used up by the other side...”

As he walked back home, he noticed two men following him. He turned his head slightly, pretending to scratch his shoulder, to get a better look. One was of color, the other wasn’t. They were both in their mid 40’s.

Matt quickened his step, but so did they. Matt began to run, and it was immediately clear he was their target.

Suddenly, a thud came down on Matt's head. His eyes slowly closed and his vision gradually turned dark, like drops of ink falling on a paper that eventually merged into a sea of black. He saw the men going through his bag, and then heard sirens and police. He went unconscious immediately afterward.

When he woke up, he thought, "Am I dead?" He moved slowly to one side, moaning from an unexpected, throbbing pain in his head. He looked where his canvas bag had been, and sure enough, it was empty. All the food Sofia had given him was gone. When he finally found the strength to stand up, he found a single steak on the curb, obviously dropped by his attackers but still wrapped in the white paper on which Sofia had drawn a smiley face. He picked it up, happy to have a meal for the family, and even happier to have Sofia's drawing to hold onto.

Once Matt arrived home, he ran to his room, his head pounding. He went to the bathroom to wash up, and saw dried blood that had dripped down his face. "Luckily mom didn't see this," he thought to himself gratefully. "She's already been through more than enough for one day." He managed to walk back downstairs and put the steak on the counter, minus the smiley face that he ripped out to save for himself.

CHAPTER 9

Matt awoke to the tingling of his WristX. The display read, "1 New Message".

"Read the message," Matt commanded.

“Matthew,” a simulated female voice began from the the WristX, “I need to see you soon. I want to make a difference. I hope your WristX is still charged. Go to the park again. Please don’t let me down.”

Matt, in truth, hadn’t stopped thinking of Sofia. The stakes were even higher now, though, as the Energized and the Satisfied weren’t allowed to mingle, and Sofia’s father was more than aware Matt didn’t measure up. There was no law against it, at least that was comforting, but it was just how things were. Kind of like an unwritten rule of EBC, no one questioned it anymore.

After Hurricane Aeolus revealed the weaknesses of the calorie system—as well as the banking system’s indiscretions—temporary bandaids were put in place by the federal government to quell everyone’s panic. The poor, already tired and hungry, were easily subdued; the rich, however, instantly recognized the high stakes, and greedily worked to secure an even deeper foothold than before.

The Satisfied Class became more “satisfied” than ever, and approximately 60% of the Energized Class split into a subclass called the Emaciated. Hate, jealousy and resentment burned like wildfire in all directions. Some people who had been very close to becoming “Satisfied” slid firmly back into the Energized class, now considered “middle class,” while the richest continued to multiply their stocks and their calories.

While looking down upon the Energized Class, the Satisfied occasionally fought for the Emaciated, as “Good Deeds for the Emaciated” earned them tax rebates in the form of energy bars, and an overall “warm, fuzzy” feeling they were so lacking in their luxurious lifestyles.

Despite the instability of the day, and her father’s warning, Sofia and Matthew met again. They again talked for hours. Every conversation seemed interesting,

as long as they were together. They talked about politics, dreams for the future and how things should change. Filled with the energy and idealism of young love, they felt power to take on the world, and to help it for the better. In fact, being together was like food itself. It seemed to recharge them both.

They talked about food, too—a lot about food! Sofia brought Matthew more calories, and a special version of EBC energy bars that Matt had never seen—chocolate, vanilla and strawberry, and even one with nuts! He ripped open one of the packages and immediately took a bite—then got a perplexed but ecstatic look on his face. “This is an EBC energy bar? Yum!” Indeed, the label had the same stamp and “EBC” logo, though the packaging was more upscale. Matt couldn’t believe he’d never seen one, to which Sofia replied, “Yeah, sorry, we only eat those in emergencies, like on long trips...I wish I could’ve brought you something better, but you said to be careful...”

Matt was thrilled with her gift of the deliciously-flavored bars to feed his family that day. “I’m glad you were careful,” he told her. He showed her the gash on his head from the day before. He told her how yesterday – starting with his father’s passing and ending with the robbery—had seemed like a lifetime. “The only good part was you...” he said, looking sincerely into her eyes.

They decided to meet as much as they could. Each day, Sofia would bring Matt a day’s worth of food, and they’d talk. Relieved of the pressure of hunting or fighting for food, Matthew appreciated Sofia’s generosity and especially the chance to spend time with her.

Though their time together was sweet and mutually satisfying, Matthew began to be plagued with thoughts of the house, his father, and his final wishes. His was grateful for Sofia in his life, and even told her that he felt she was the real “Gift

from God,” but knew he had a bigger job to do. While his own family was eating daily, they were in the minority. Matthew knew he had to get back on track with the mysterious mission he felt had been placed in his lap, and he eventually built up the courage to tell Sofia about the house.

He explained the whole “Gift From God” mystery, and how he had only learned that this name meant that the day before he met her, through a random search. He told her about the food he had found there, the beautiful loaf of bread he was not allowed to touch and its amazing aroma, as well as the smaller, wrapped loaf he was allowed to take, about the plans he had received and the dreams he had to fulfill.

To Matthew’s shock, Sofia said she thought she “already knew” about the house, at least from a “fiction” story her father had told her when she was really young. “I always thought he’d made it up,” she said. “He told me not to tell anyone, not to mention a word of it until I was older and needed it...” she added.

Sofia shared what she remembered from her father’s story. The house was previously owned by the late Mr. Lucas Economo, the founder of Enlightenment Banking Corporation, the all-seeing, all-knowing EBC.

“Well, that answers my first question,” Matt thought to himself.

Sofia continued. Her father described a robotic “sentry” of sorts, that was invented by a scientist-friend of Economo and placed inside the house, then never properly deactivated. “In fact,” Sofia said, “if I remember my dad’s story correctly, the sentry can only be deactivated by Mr. Economo himself—which certainly posed a problem once he died! Anytime anyone would get near the house, the robotic sentry would open fire. My father said the house was a good-will project funded by Mr. Economo to punish looters. Thieves, looters, basically anybody

with bad intentions could pass by and think the house was just like any other house. If they walked up to the doors and tried to force entry—even so much as jiggling the doorknob—they’d be killed, and their bodies dropped down a trap door on the porch...” Sofia’s voice trailed off, she took a deep breath, then continued, “That part really used to scare me as a kid... For years, I was terrified of knocking on doors, touching doorknobs... The nanny did it for me...”

Matt laughed at her innocent sharing, while he simultaneously breathed a sigh of relief as he recognized the danger he didn’t realize he had been in. He gave her a quick, reassuring hug—the kind he’d give his sisters when they looked afraid—and when the two stopped hugging, he kissed her hand.

“OK, let me see, what else do I remember?” Sofia said nervously, obviously delighted by the kiss she’d just received, which she covered protectively with her other hand. “The door was secured by many deadbolts and couldn’t be opened, not even with advanced equipment. But Matt,” she suddenly said, with a perplexed look on her face, “that couldn’t have been the same house. If it were, you wouldn’t be here to tell...”

For their meeting the next day, Matt brought the plans from the basement of “the house.” He was anxious to see Sofia and to hold her hand while they walked and talked, which had by now become common for them.

He waited hours but Sofia never came. He attempted to send her messages, with no reply—and worse: “undeliverable” was the auto reply he received.

He sat at their “spot” for hours, finally leaving dejectedly at nightfall, and being forced to arrive home—for the first time in weeks—with no food for his family. While his sisters ran to greet him at the door, he had to break the bad news to them: “Not today, girls. Save your energy. Go to bed...”

He showed up the next day to meet Sofia, and the same thing happened. The third day, he waited all day. His family was hungry, he was hungry, but above all he missed Sofia. At the end of the third day, Matt started to give up hope. As the sun set, he made the decision to leave. He stood up dejectedly, but before he moved, he heard from the distance, “Matthew! Matthew!” It was Sofia’s voice! He turned around quickly, and his troubles melted away.

“Sofia! Are you okay?” he asked. “Why do you have that suitcase?”

“I’m running away,” Sofia answered. “I’ve lost my taste for food. I can’t eat anymore knowing how many people are dying. I can’t live with myself.

“I’m running away with you,” she concluded, “to change the world.”

Matt grabbed Sofia’s suitcase, and held her hand firmly. He whispered as they quickened their step, “I’m so glad to see you... and I have a plan.”

CHAPTER 10

Matt arrived home with Sofia at his side. His mother stood at the door, perplexed. He hadn’t told her the “whole story” about Sofia—or even half of it—and while vowing to do so sometime soon, for now, he lied. He told his mother that Sofia’s father had died, too, and that she needed somewhere to stay.

From Sofia’s custom clothes to her plump, rosy cheeks, Matt’s mom could easily tell she was a member of the Satisfied. His mother greatly resented the Satisfied, whom she blamed for her husband’s demise, and her family’s woes. Without their greed, her husband might still be alive. However, Matt was the man of the house, and he had never done anything to disrespect his family or put them in jeopardy. In fact, it was just the opposite.

Though she knew the family could in no way accommodate this girl's usual lifestyle, Matt's mother decided to bite her lip. "Welcome," she said simply, and walked away. Matt arranged for her to stay in his father's old bedroom, where he spent some unusually pleasant time with Sofia cleaning, chatting and changing the linens.

In the morning, after breakfast water and a flavored energy bar, Matt and Sofia took a walk. He told her that he had also received a loaf of bread at the house, "but not the one on the counter," he reminded her. "I wasn't allowed to touch that one..."

"Even for the Satisfied, bread is hard to get a hold of!" Sofia exclaimed. "Was it fresh?"

"Well, the loaf on the counter seemed fresh-baked for sure. I couldn't touch it, but I could smell it, and I'd swear it was warm... But the other one is certainly valuable as well..."

Matt had considered what to do for weeks, and told Sofia his decision. "The note said I could change the world. I believe I can, too, or at least, I have to try. If I fail, I fail, but I couldn't live with myself if this bread could feed millions. Maybe I could sell it, one loaf at a time, to buy supplies to build the plans outlined in the schematics. I don't really understand them yet, but I think I'm getting an idea.

"The plans outline some type of new-fangled agricultural system where plants and fish are grown at the same time, in the same space. There's a hydration and filtration system, and it's all perfectly synced and solar-powered. The plants feed the fish, and byproducts from the fish supply nutrients back to the plants. If it really worked, everyone could set up a system like it in their own basement or garage! The schematics show proportions that seem like they'd work on almost

any dimension. And, what if they really do work, Sofia? No one would have to steal food. Everyone would have a chance to receive a decent caloric return on their labor! Imagine a world where everyone could stop worrying about food, and start learning about the universe again, about science and geography, hopes and dreams!”

“If anyone can do it, we can,” Sofia said.

Matt walked back home with Sofia and up into his room. He went into the corner of his closet, and unwrapped the hidden loaf of bread from the blanket. He squeezed it, finding it was still reasonably fresh, then put it in his canvas bag. “Stay here, Sofia,” he cautioned. “Bread is illegal. I doubt the people I’ll be selling this to will be very friendly.”

“I understand,” Sofia replied. “Come back in one piece.”

After walking a few miles, Matt passed a familiar pawn shop with a sign outside that read, “We Buy Gold Bullion,” a hidden keyword for black market food. He walked into the store casually and, after he looked around a bit, an older man approached him and asked, “Can I help you?”

Matt looked at the man’s shirt. Just above a small ketchup stain was a nametag that said ‘Gary.’ “I have some gold bullion to sell,” Matt replied.

Matt then placed the loaf of bread on the counter. The man looked down at the bread and then slowly back up at Matt. “I don’t know who you are, or how you managed this, but you must be quite a thief...!” the man said, with a tone of sinister respect in his voice.

“Whattya’ want for this?” he asked curiously.

“I’d like to change the world,” Matt replied. He set his plans on the counter and explained what he needed. As Matt began to explain, Gary locked up the Pawn Shop then said, “Let’s go in back.”

Once in the back, the pair sat at a table with the loaf of bread between them. Matt began to explain. “It’s an Aquaponics system. The fish feed the plants and the plants feed the fish. It’s like a mini-ecosystem. You can grow it indoors, on a big scale or small, with very little agricultural know-how.” Matt’s eyes widened with the passion of a 17 year old, but just as quickly mellowed, as if held in check by the wisdom of life’s trials.

“You know, kid, I used to be an engineer. These plans... they’re brilliant, simply brilliant! I may be able to help you, but this could get dangerous. The Satisfied? They’re perfectly happy with the status quota—I mean, quo...” Gary said, which took Matt instantly back to when his father had taught him about what “quarter” was, which Matt mistakenly called a “quota”. “That must’ve been where I got that from,” Matt’s thought drifted for a moment, remembering his father’s wisdom trying to fight the system before it got to this point. He brought his thoughts back to the table, focusing on the bread and Gary’s words.

“You trying to feed people, being hell-bent in all the wisdom of your 17 years on ‘changing the world for the better’—that is a threat. It’s a threat because you’ll turn slaves back into free men, and somebody won’t like it. Don’t know how much history you know, but there’s plenty a’ stories about stopping slavery, and even after lots of people die and it somehow goes away, it’s never quite gone.... So anyone you talk to is in danger, anyone you love is in danger—starting first and foremost with you.”

Matt immediately thought of his mother and sisters at home—and of course, Sofia—and felt a pit of fear settle into his stomach. For the first time in his life, he whispered some words—a prayer—to whoever his father always prayed to, and asked for help. Just doing that gave him a sense of calm.

“Live fish will be a challenge,” Gary said, “but I can swing it. I’ve got tons of seeds from the shop, no worries there. I got a guy downtown that works with cars, he can get us some pumps and hosing. If you know anything about power tools, you should be able to rig ‘em pretty well according to the schematics. There’s lots of detail there.

“I’ll help you build the containers, too,” Gary continued. “In fact, my cousin used to sell above-ground swimming pools—you know, the ones everybody could afford—and the market crashed on those decades ago. He wound up with lots of inventory—pumps, filters.. I think it could work...”

Matt could hardly believe his ears. All that help from one loaf of bread?

“I have tons of large investors who’ll give big for this loaf, kid,” Gary said. “It’s still fresh, I’d say not more than four days old—it’s worth a lot, but we have to jump before it depreciates...”

“So, we have a deal,” Gary concluded. “You can’t tell anyone anything—for your own sake, not mine... I have nothing to lose, I’m an old widower with just a few years of starving left, and this whole idea is giving me hope. It’s downright *energizing*...!”

Gary concluded with a few words of wisdom that he urged Matt to heed. “You’re gonna’ put people in danger until you’ve got an army behind you. Do you understand?” He bid him goodbye with a firm handshake as he ushered Matt out the back door.

“From now on, you come and go through here. City cameras are everywhere, but there’s lots of tired, hungry employees manning them—so you should be safe for the most part, unless someone gets ‘interested’ and does a search... then all your pictures and video will pop up, you’ll have a lot of explaining to do. Try to keep a low profile,” was Gary’s last advice. “I’ll see you in two days.”

Matt finally had a supporter—his second for now, another scientist like his dad who believed in him for no apparent reason. “It’s just a feeling I have,” said Gary. “This could be a gift to lots of people...”

“Yes, I understand... thank you.”

CHAPTER 11

Matt returned home bursting to share his news with Sofia. “I’ll have to be careful,” he told himself. He knew Gary’s warning was wise, so he toned down his enthusiasm around Sofia.

“How’d it go?!” she asked him enthusiastically. “Any good news??”

“It went good, good,” Matt said abruptly, resisting the urge to spill details. “Yeah, so, it went good...”

Sofia could tell from Matt’s tone and the look in his eye, that there was more to the story. Matt looked Sofia directly in the eye and said, “Do you trust me?”

“Of course, Matthew,” Sofia replied.

“Then don’t ask me anything. Just keep trusting me. Know that I’m doing everything I can—to help the world, to make our dreams come true.” Sofia could feel the truth of Matthew’s words feeding her soul yet again, and with that, they kissed tenderly for the first time.

Two days later, Matt headed back to the Pawn Shop as he'd promised. Halfway there, he thought he noticed something. He felt someone was following him. It was a busy sidewalk, he couldn't be sure, but he locked eyes with a fellow pedestrian for a brief, confusing second. When he turned his head around again, the man was gone.

Matt walked around to the Pawn Shop back entrance, giving the signal Gary had taught him, and was instantly let in. They again sat at the table. "I need to lock up out front," Gary said, and disappeared momentarily.

When he returned, he laid out many interesting parts on the table – tubing and fluid pumps, seeds and filters, electronics, meters, power supplies and gadgets. "It's like a candy store in here!" exclaimed Matthew, who had always been fond of spare parts.

There were 15 clear plastic bags of medium-sized salmon resting on the counter. There were also small plants, tomato and spinach. Gary said, "I believe in you, kid. God only knows why, and I wish I did, too...! With great power comes great responsibility. Keep that in mind. If you're ready, let's start building..."

Gary and Matt spent the entire day assembling the system. They welded the frame together, hooked up tubing, and tweaked the pumps. They placed the fish inside the glass box and gently put the plants in the lightly-bubbling water. Gary wired all the electronic timers for the pumps, and Matt programmed the electronics based on the schematics so as to feed, filter and circulate everything to plan.

Researching during both days of his absence, Matt had thought ahead enough to bring supplies from his old home chemistry kit to monitor the water's pH and also installed a small pump to regulate it. They added lights and temperature

controls. The last touch—exactly according to the directions—was a drop of Mr. Lucas’s *Growth* formula. Though the contents were not disclosed, Matt had analyzed a drop of the liquid at home in his garage using an old, but functioning gas chromatograph that his father had designed and patented. This amazing machine allowed the compounds to be vaporized without decomposition, then identified. Matt remembered playing with the chromatograph on weekends with his dad, analyzing everything from drops of blood to dish soap. He knew exactly how to use it. Oddly enough, upon analyzing the *Growth* formula, the touch-screen on his dad’s machine seemed to identify the substance immediately, and already had a name for it: *Future Feast Formula*. Though Matt found that odd, he didn’t have time to think about what it meant, or why his dad might have entered that particular name as “default” data.

The chromatograph revealed that the *Growth* formula contained a mixture of strategically useful nutrients for optimal fish health, as well as calories. Once dropped into the fish portion of the tank and consumed, *Growth* would genetically modify the male fish’s DNA so it would grow twice as large, with a reproduction rate of half the normal gestation period. The byproducts obtained from the fish excrement were in turn somehow modified by the *Growth*, and subsequently, genetically “encouraged” the plants to grow twice as large and twice as fast as normal. The plans included directions on how to make the formula, and the cost per bottle came out to a mere 100 calories.

When Gary and Matt were done, the unit took up the entire room. It wasn’t the most modern-looking system in the world, but it worked. As far as they could tell, everything was properly hooked up and functioning well. At this point, it became a waiting game.

Every day Matt and Sophia would visit, tend to the vats, and dream about the future. They mused about a world with no social classes and no hunger. Gary pilfered a bit of food from his stocks to feed Sofia, Matt, and his family. They waited patiently and with hope.

Then, the first tomato grew. The next day, there were two. Then four, then six! Lettuce and spinach grew rampant. Within a month, there were baskets full of vegetables and fish. The fish were reproducing so quickly that they were forced to harvest and sell them so as not to overfill the tank!

Matt and Sofia didn't want to make money from this invention, which had now proven successful. In fact, Matt didn't even feel he had the right. Dividing up the vegetables and fish equally into 20 meals, they wrapped each meal in plastic and distributed them across the city – to homeless people, to the handicapped. Sometimes, they left meals on doorsteps or on the seats of transportation pods – anywhere they saw a need.

The next day Matt woke up, filled with excitement. He walked downstairs and sat at the table, delighted as he waited for a real breakfast—a fish filet with grilled tomato! As he relished each bite, the TV in the background suddenly beeped an alarm: “Confusion has filled Queens, as reports are circulating that unexplainable calories are being distributed by anonymous donors. City Detectives indicate they believe someone has stolen the food to feed the poor. Despite the appearance of goodwill, anyone found guilty of theft will be prosecuted. In other news, two buildings suffered extensive damage last night after what Police suspect was a protest over the failing calorie system. The two buildings involved are the EBC and a nearby Pawn Shop. Police suspect a terroristic act. The only reported casualty is 63 year old Gary Malcoms, a local of Queens. Tune in tonight for more details...”

Matt's joy was suddenly doused with grief. He ran to the Pawn Shop, Sofia at his side, and confirmed the news story. The Pawn Shop had been blown up. Matt checked his wrist for the time, but instead found a new message—from Gary—sent last night: “Attached are directions to a storage facility. Tonight after you left, I moved our little gadget, because I saw a man following you on the cameras outside. I didn’t want to scare you. Two men at the door waiting for me to leave... Take care, kiddo. I believe in you, Matthew. Make this worth it...”

Matt decided it’d be best to lie low for a few days. After three days, Matt stepped outside and waved for a transport pod and headed where Gary’s message had instructed. There were piles of rusty boxes all over the place, which Matt assumed were the “storage containers”. Matt walked up to the office and gave the clerk his number. “Oh yeah, that urgent delivery. Second row, 5th down. Here’s the key.”

The clerk tossed the key at Matt, which he luckily caught. He’d never been very good at the hand-eye-coordination thing but catching it made him feel smooth. With Sofia at his heels, he hurried down to the container and unlocked the doors. Everything was there. The food, the fish, everything safe and sound. After dividing it up, there were over 100 meals. Matt put them in a big box and called for a transport van.

Once home, he pondered what to do with the meals. The tactic of leaving them out anonymously had caused suspicion and accusations. This time, Matt had something different in mind. He scanned all the paper plans into his WristX, and made hundreds of copies. Then, he uploaded instructions to his own blog, MakeYourFood, and gave detailed instructions on the build and the formula. He told Sofia his plan.

Tomorrow, they would put their dreams into action.

CHAPTER 12

“Free food!” Matt shouted from the street corner. “One per person, please!” he shouted as a mob rushed toward his makeshift table. Each meal bag contained a copy of the plan, “Make Your Own Aquaponics System.” He had extra copies on the table, with wireless transfers to WristXs also available and links to the online blog for discussion and help. The meals were gone in seconds, and Matt could feel the energy. The media began to swarm. This was no longer an idea; it was a movement.

Matt waved for a transport pod to pick him up for another trip back to the storage container. Just as he approached his unit, however, the pod suddenly stopped and lowered to the ground. “Just my luck!” Matt said in frustrated excitement, pulling on the handle to open the door.

The door remained shut.

He pressed the emergency button and still no response. A man in a long overcoat approached the car and opened the door from outside. “Are you Matthew Simons?” the man asked, one hand inside his coat.

“Yes,” Matt hesitated. “Who are you?”

“You’re under arrest for terroristic acts against EBC headquarters earlier today, the murder of Gary Malcoms, and treason. Please enter the pod.”

“Gary? Gary was my friend. I could never... Treason? What treason?” The man pulled out a laser pistol and repeated, “Please, enter the pod.”

Matthew acquiesced. After 45 minutes, they arrived at a windowless, colorless building. Matt was guided through the door and into a room. The door locked behind. The room was completely empty except for a cold chair and table, and two security cameras. Matt sat down as directed. He was numb.

He waited there for what seemed like hours. Finally, the door opened. He jolted himself awake, wary of the next minutes.

“Sorry to keep you waiting Mr....Simons, is it?”

Matt did not respond. He was certain the man already knew his identity.

“Do you know why you’re here today, Mr. Simons?”

Matt remained mute, at which the agent repeated, “Do you know why you’re here?”

“For feeding people. For wanting to make a difference. For working to change the world one meal at a time.”

“Your passion intrigues me, Mr. Simons,” the man said smiling. “But no, that’s not why you’re here. You’re here for the same reasons your father was once here—for thinking you could use your intelligence, or some intangible ‘God-given’ sense to make a difference. His mistake was creating the formula, the sentry at the house, and then turning on Mr. Economo just as world domination was in our grasp—then somehow convincing Lucas to turn on us, too You’re here, Mr. Simons, for trying to upset the status quo and to incite revolution.”

Matthew could hardly believe his ears. His father! His father was the author of it all, for the good! Now it all made sense, all the pieces fit together—the house with his name on the keybox, the sentry who allowed Matthew in, the chromatograph that recognized the Growth formula, his work as Chief Scientist with EBC and

his eventual fall from grace—his father had paved the way for a better world and, now more than ever, Matt knew it was his duty to continue it.

“I’m being detained for feeding people?”

“For ruining the status quo. Things are already perfectly balanced: hot and cold, night and day, energy and weakness. Power must remain in power. The Satisfied are in control. We alone control the food supply. It’s safe this way.”

“Malarkey!” cried Matt, using a term he knew his father enjoyed. “Your ‘status quo’ isn’t worth more than—a quarter! People already know they are on their own, that they don’t matter. That they could be dead, and regularly die of starvation, for all you care.”

“The Satisfied are naturally superior. The Emaciated, and even more so, the Energized are a strain on the system. They must die to keep the balance in check. It’s a simple matter of evolution!”

Matt couldn’t believe his ears. All those years, all the “conspiracy theorists” were right—the Satisfied were waiting for them to die out, so that they alone could claim the world’s riches!

The man continued, “Your little plan to ‘help the world’ has already gone too far. Rumors are circulating in support of the ‘MakeYourFood’ idea, and we will swiftly resort to discrediting it, and you—just as we did your father.”

Matt looked squarely into the agent’s eye, and said resolutely, “I’d like to see that work.”

“Of course it will work! Framing you for the EBC bombing, and the accompanying murders will be child’s play! We own the media, and next we will inform them that you have kidnapped Mr. Bono’s daughter, Sofia—Mr. Bono will certainly

work with us, just as he did years ago, when he, too, worked with your father and Economo, but took the better choice of blackmailing them, in order to remain among the Satisfied.”

Matt couldn't believe his ears but, still, he had to keep focused. “If your plan can survive a live feed from my WristX which has been streaming in real time since our conversation began, then I wish you all the luck.”

The agent looked mortified as he glanced down at Matt's wrist to confirm the story. “As for me and my house, we don't need luck. We get our energy from...a higher power.”

Just as the agent was about to strike a fierce blow to Matt's head, the door flew open and an urgent voice said, “Sir, someone's posted bail for Mr. Simons. We are legally obligated to release him. And apparently... they have evidence, sir. *Video evidence...*”

The sinister agent suddenly became docile in Matt's presence, and urged, “Remember me, sir, when you become Satisfied...”

“That day will never come,” Matt said resolutely.

Matt walked for a bit before he finally saw a pod. As he flagged it down, a nearby car took a sharp turn and then abruptly stopped. A man inside asked, “Are you... Matt Simons?”

“Who wants to know?”

“You're him! The one that was just all over the airwaves and live streams...the one trying to help change the world! You're a hero!”

“I guess that's me.”

“I’m Jack Thompson, reporter for CMN. Could I talk to you and your girlfriend tonight on World News?”

“Only if I can get a ride home,” Matt said.

“I can do that. Hop in!”

Once home, Matt gave Jack his WristX number and arranged the interview time for later that evening. Matt entered the house to find Sofia sitting on the couch next to his Mother, with Katy and Marissa on their laps. It looked like a perfect family scene, just the one he could handle coming home to every day.

Together they had heard the live stream that by now had played on every channel and was uploaded on multiple sites with millions of views. The stream was causing a revolution. The world was changing for the better.

Interview with Jack Thompson

“I’m here today with Matt Simons and Sofia Faith, founders of the MakeYourFood movement. How are you today?”

Matt responded, “I’m doing fine, a lot better than our good friend Gary Malcoms, who perished last night in a vicious attack on the movement. He and my own father, Mark Simons, should always be remembered as equal founders of this miraculous time in history...”

Matt and Sofia answered as many questions as they could, weaving together the remarkable web of a past filled with dedication and sacrifice and a future filled with hope.

“Bread” Timeline

Circa 2015–2020	Matt’s dad works in well-stocked grocery store, going to college full-time
2027	Deep Credit Freeze – poor cannot get credit, grocery stores still exist, with less and less stock
2028	The Great Hunger (GH28)–stores closed, previously well-stocked grocery stores run out of food
2030–32	Banks convert to “food deposits” and “food accounts”; later try pick-up service–all risky, but food starting to be a currency
2032	Founding of the EBC
2032–35	Matt’s dad employed as scientist/VP with EBC
2033	Matt is born
2035	Founding of Energy Bar program
2040	Minimum US RDA set at 3–4 energy bars/day, depending on height. EBC the “new treasury”; fed gov’t jumps in to regulate, can’t do much
2048	The Great Outage occurs as consequence of Hurricane Aeolus
2050	Story opens there, line at bank; Matt’s dad dies; Matt meets Sofia



Afterword

Are you a breadwinner? A longtime cultural symbol of vitality and wealth, the term “bread” has been used in a variety of ways, most referring to money, sustenance, satisfaction, or even physical and spiritual health. Bread is a story about the realistic possibilities of the world’s future food supply, as well as the resulting commercial and social consequences, if we don’t start to take hunger seriously now. How will humanity cope? How will wealthier nations be impacted? How will the world economic system respond? If we ignore the potential, and the need, for significant scientific leaps to accommodate the impending food shortage – which statistics indicate will result by 2050 from a growing population and an indifferent attitude toward the world’s resources – the results could indeed be devastating. Bread portrays an eerily-realistic scenario of what may happen by smugly choosing to ignore the current state of affairs. While it’s very easy to say, “We can worry about tomorrow’s problems tomorrow...,” the Tomorrow Project inspires us to do just the opposite. It inspired me to look beyond and ahead into a scary scene, a possible future without my own “daily bread” or eggs or cheese, where faces of hungry children on television are my own, or my neighbor’s. Set in a dystopia where money is food and food is money, one teenaged scientist, Matthew Simons, seeks to change the crash course of a global community spiraling out of control as a direct result of its depleted food supply. That’s where Bread begins.



MATERIAL SCIENCE

by Raymond Gilmartin

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ARIZONA STATE UNIVERSITY

My friend Adam pestered me constantly. He sent me fifty messages every day telling me to ask Erin to the Winter Formal Dance. “C’mon, she likes you!” he said. “The dance is on her birthday and you know she really wants to go with you. Hurry up. Just man up and ask her!”

I liked Erin and Adam found out for me that she would go with me to the Winter Formal. Most guys won’t ask a girl to a dance unless they know she will say yes. How do they know? Friends. You ask the girl’s friends to find out if the girl is interested in you. They will not ask you why you want to know because they know what’s up: You like her. They’ll ask her if she likes you without saying why they’re asking. They’ll be very casual about it, asking her about you and a bunch of other guys in the same conversation, so she won’t suspect a thing. If she says yes, she likes you, they will tell you and even help you ask her to the dance. If she says no, she only likes you as a friend, they’ll tell you that. No harm will be done because she didn’t know you liked her in the first place.

I wanted asking Erin to the dance to be something special. I’m a pretty shy guy, so I didn’t want to make a big scene and ask her in front of the whole school like some guys, but something more than a “Hey, you want to go to the dance with me?” blurted out during lunch was needed. Adam’s advice was “Remember the three C’s, Ryan: cute, clever, and creative.” I didn’t know exactly how I would ask Erin but I knew nanomesh was the something special I needed.



Ten years ago the world was transformed by nanomesh. Lighter than plastic and stronger than steel, this material, made of precisely-bonded carbon atoms, is better than plastic plus steel. It is more like plastic to the power of steel or steel to the power of plastic. It's exponentially awesome. It's in everything from smart devices to jet planes, except things that need to be heavy. My parents had to get heavier glasses because my little sister kept knocking over her nanomesh milk glass. On the other hand, she could clear the dishes by herself in one trip.

I was 4 years old when the first nanomesh products hit the market. My parents bought me nanomesh wind-up cars for my birthday. The little cars whizzed along at ridiculous speeds, going so fast they dented our walls. They were such a blur I couldn't see them as they raced along. To this day, we have blue and red pockmarks on our wall, but that's okay because we're getting walls made of nanomesh soon.

When my family vacationed in Hawaii last year, we flew on a plane made of nanomesh. Ticket prices are lower than they used to be because jet fuel costs are lower, and flying time is shorter because cruising speeds are faster. This makes my parents very happy. They don't like plane trips that take longer than the length of a movie because my sister and I start fighting soon as the movie is over. We zip from Los Angeles to Hawaii in under two hours. Nanomesh is so thin that airlines have been able to add three more layers of soundproofing to their cabins. The cabins are quiet, with no engine noise. After adding the extra soundproofing, the airlines still had oodles of leftover space, so passengers have more legroom than ever before. My parents can doze happily.

My grandfather told me that his first car struggled to eke out 30 mpg, but our car can easily get 100 mpg because of its super-light body and engine. Today, Formula One racecars with their tremendous horsepower zoom around circuits setting new records every year. Street cars are aerodynamically shaped. They look like teardrops with long tails that can retract for easy parking and tight cornering. Stalled cars on roads are no longer a problem because a single person can push his or her car to the side. No need to wait for the tow truck driver. We drive at much higher speeds, too, but it's safer because cars are much stronger. There is no such thing as a fender bender, and although I've heard of them, I've never seen a door ding.

Transportation costs are much lower because of nanomesh cargo ships, freight trains, and trucks, so products cost less than they did before and items get to stores faster than ever. We're loving our nanomesh-enhanced world.

The age of nanomesh is a lot like the age of steel I learned about in history class. Steel was also a wonder material, harder and stronger than iron. Before 1856, steel was difficult and expensive to make, then inventors devised new methods to make steel more efficiently and more cheaply. Soon steel replaced iron, making products stronger and more durable than ever before. Did I tell you that I've been to the Golden Gate Bridge, the Chrysler Building, and the Empire State Building? I love the computer age. Don't we all? But the steel age was pretty amazing, too.

The Empire State Building is a tribute to the steel technology and steel workers of the twentieth century. Its steel girders were made in a Pittsburgh factory and shipped by train, boat, and truck to its New York City site in 18 hours. Sometimes the beams were still hot when they arrived. The steel girders were then lifted into place by steel cranes and fastened down with rivets made of—you guessed it—steel. Riveters worked in teams of four. One person heated the rivets to 800

degrees and threw them fifty feet to another who caught the red-hot rivets in a metal cone and passed them off to two riveters who pounded them into place. Working this way, each team could hammer in 400 rivets a day, securing beam after beam after beam. The Empire State Building was built at an astounding rate, 102 stories in just 13 months.

Even more amazing than the speed with which the Empire State Building was built is why it is an icon today, one of the Seven Wonders of the Modern World according to the American Society of Civil Engineers. The architects and owners did not set out to build New York City's defining landmark. The building was the result of rivalry between Chrysler and General Motors. John Jacob Raskob, a former General Motors executive, wanted to build a building taller than the nearby Chrysler Building. The building's iconic spire was added to give the Empire State enough extra height to top the Chrysler. The spire was put to good use, holding television antennae during the golden age of television. The Empire State Building's famous tapered shape arose from a New York City regulation requiring skyscrapers to recede as they rise, so sunlight can reach the city streets below. On sunny days, these setbacks result in a beautiful pattern of light and shadow that we still admire today. Constraints forced the architects, engineers, and contractors to solve problems, and they came up with solutions that not only solved immediate concerns but also resulted in lasting beauty.

Nanomesh is great material, but it has problems, just like the Empire State building did. It is made of carbon, so finding source material is not hard, but, wow, it takes a lot of energy to turn carbon into nanomesh. Now my generation has to figure out how to make it efficiently, just like Henry Bessemer figured out how to make steel efficiently. I'm thinking – use solar energy as an energy source? I'm thinking – how can we sequester the end products that we don't like?

Ideally, how can we cut them out altogether? I'm thinking – how can we close the chemical cycle on nanomesh?

Fortunately, I also learned about the law of conservation of energy in physics class. Energy is neither created, nor destroyed, just changed. That's awesome because we'll always have it. The universe started with all of it and it's all still here with us. Lucky us!

Guess what? Human determination and effort are also inexhaustible, and even better they are infinite. We may always have problems to solve and issues to deal with, but we will also always have the energy of the universe to work with and the power and creativity of a new generation to do the work, get results, and create something of lasting significance. Science fiction? I think not! Take it from a 14-year-old kid like me.



Made mostly of carbon, a nonmetal element, nanomesh doesn't have the properties of a metal. It's not ductile, shiny, or malleable. It cannot be pulled into wire, but a creative engineer figured out how to weave it into rope. Ultrathin nanomesh sheets are rolled into tiny tubes that are then braided, wrapped, or twisted into ropes of different thicknesses. I decided to use nanothread, a super fine version of nanomesh rope, because it is invisible to the naked eye, but easy to see when viewed through special glasses. Invisibility was a problem during the early days of nanothread. How can you tie or cut thread you can't see? (Nanothread has forced magicians to come up with new tricks because nanothread makes illusions like levitation too easy.) Soon, though, manufacturers began treating the thread so it glowed bright green when viewed through special NanoSee glasses. NanoSee glasses remind my parents of the

glasses they used to wear to watch 3-D movies when they were kids. Today, we enjoy holographic movies that are even better and don't require glasses, but NanoSee glasses and nanothread were just what I needed to construct a for-your-eyes-only event in a public place – my high school.

On the appointed day, I could barely focus during my morning classes. At lunch, I devoured my sandwich and stood in the center of the quad, nervously tapping my foot. After lunch, I watched as Erin climbed the stairs to her classroom on the second floor. Her classroom overlooked the quad. She stood on the balcony waiting for her teacher to open the classroom. I saw Adam hand her a pair of NanoSee goggles as planned. He pointed down at the quad. Confused but game, Erin put on the glasses, looked over the balcony, and smiled. On the ground, taking up the almost whole quad, I had written my nanothread message: “Erin, Winter Formal with me?” I stood next to the question mark and smiled up at her. The giant letters of my message were just visible under the hundreds of students scurrying to class, unaware of the words they walked on. No one tripped because nanothread is thin, no one ripped up my letters because nanothread is strong, and no one could see the bright green glowing words, except Erin. She said it was cute, clever, and creative.



Afterword

My story was inspired by the phrase “strong as steel.” I learned about the age of steel in history class last year and I was awed by the power of this material to change the nation in the 1800s, mainly by expanding railroads. But I also know that steel is in the silverware I use every day at home. “Stainless steel” is embossed on every spoon and fork in my house. Steel was the model for my 21st century wonder material and the story of steel the model for my story. The material I envision in my story has a large global influence, it has small personal impacts, and it has an unintended consequence for a boy that is as material to the boy as everything else. I envision an entire world changed by materials science.

GREEN DREAMS



ARIZONA STATE UNIVERSITY

When each of us were teenagers we read Henry David Thoreau's *Walden*. Thoreau retreated to a little cabin by a lake in order to commune with nature, to discover himself, but mostly to find a quiet place to write away from his busy family home. Taken with his style of thinking, one of us decided to do something a little different for a high school presentation on *Walden* – producing a huge cardboard shipping box in class and installing himself inside. He delivered a muffled commentary on the benefits of seclusion and then ignored all questions until he was gently but firmly extracted by the teacher. Our other co-author retreated to an actual secluded forest along the Hudson River one summer while in high school—only to discover that living with peers in cabins with no electricity or running water required a great deal of ingenuity. So that his experience, *in the wild*, made him hyper-aware of how nature can be so much more enjoyable with the assistance of technology.

The thing that inspired the teenage versions of each of us still lends Thoreau's book its fire today: the cheerful prose of a great mind at play. As he put it, "I do not propose to write an ode to dejection, but to brag as lustily as chanticleer in the morning, standing on his roost, if only to wake my neighbors up." And while we're not half the roosters that Thoreau was, we can crow with abandon about the four fantastic stories that won the "Green Dreams" writing competition we hosted at Arizona State University in 2012.

We announced this competition on the same day we at Arizona State University launched the Center for Science and the Imagination in September 2012. Our “Green Dreams” challenge to college students everywhere was in many ways inspired by Thoreau: how can we come up with more exciting, beautiful and daring visions of our environmental future? How can we make sustainability something more compelling than “an ode to dejection” and inspire new generations to build a better world? After all, this is precisely the point where the philosophy of the Center for Science and the Imagination intersects with Brian David Johnson and the Tomorrow Project: to build a better future, you need better dreams.

Our mission at the center is to get people thinking more creatively and ambitiously about the future – and that includes what we may think of as “better.” Do we mean more efficient, more effective, more inclusive, more sustainable? Just what makes for a “better” dream is open to debate but even in disagreeing, we may learn a great deal about how we collectively bring our human and environmental futures into being.

One example of this process is our ongoing collaboration with the Tomorrow Project has been one of our most rewarding exercises in collective imagination. Answering Thoreau’s challenge, these stories are wonderful wakeup calls, asking us to reimagine how we dwell in the world. In the spirit of great science fiction they use scientific knowledge to ask new human questions about the future of work, of life and of community. We’re not going to describe each of them to you here because members of our discerning editorial board have already provided generous introductions to each story in the pages that follow. Suffice to say that these stories embody a special kind of thoughtful optimism, pushing us to question the world as it is and daring to hope for how it might be more.

Introduction: Green Dreams
Ed Finn & G. Pascal Zachary

We are also delighted to include images of sustainability-inflected art created by some very talented MFA students at Arizona State University. Their work serves as a thrilling juxtaposition to these stories because they have created tangible, visible glimpses of other worlds. We strongly believe that artistic practice and the scientific method both begin from the same mental exercise of learning to truly see the world. Great discoveries and great creative work almost always seem to require a step to the side, a new frame, a sudden shift in perspective. We hope you enjoy the images and stories that follow. Perhaps the experiments these young writers and artists are conducting will inspire you as Thoreau once inspired us:

“I learned this, at least, by my experiment: that if one advances confidently in the direction of his dreams, and endeavors to live the life which he has imagined, he will meet with a success unexpected in common hours.”

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FOR THE BENEFIT OF THE PEOPLE

by Nathan David Smith

© Nathan David Smith



ARIZONA STATE UNIVERSITY

Introduction

Nathan David Smith has created a fascinating character in Vernon Moss, a “geothermal plant engineer” who experiences a brave new world by living both forward in time in terms of climate change adjustments and backward in time in terms of renewed animal populations. Rich details in Smith’s muscular prose bring to life a future shaped by personal hydrogen-fueled dirigibles and below-ground residences nourished by food grown on green rooftops. Many aspects of Smith’s “environmentally thoughtful” city create images of a vibrant, multi-generational eco-topia nestled inside a national park. Inspiring possibilities abound: Energy production and an active lifestyle fuel healthy and productive communities. Smith envisions “Yellowstone City” as an idyllic new town that is largely underground, thus leaving much open space for wildlife, walking paths, parks and even edible plants. He presents a beautiful image of what living a more environmentally balanced healthy lifestyle might be—even in a national park. A few elements flashed back to the past more than the future, giving Smith’s world some elegant and enchanting aspects through encounters with wonderful retro-futures. “For the Benefit and Enjoyment of the People” suggests the diverse approaches possible to lives defined by flexibility and collaboration, even across great distances.

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A migrating bison herd was blocking the road into town, but the plant was notified early and already had the commuter zeppelins filled with hydrogen when the power systems engineers and geothermal analysts were rotating shifts for the day, and Vernon Moss finally had a practical reason to use the air bike that he had used so much of his offset credit to manufacture. While his coworkers climbed into the gondola, he took his air bike out from his personal storage locker and walked it over to the hydrogen pumps on the side of the plant's loading dock.

A couple of years ago, the bison would have delayed Vernon's and the other engineers' arrival home by more than a few hours, either by postponing the departure via electric tram or, worse, blocking the tramway halfway to town, which would have forced him and the other passengers to sit in the dust of the migrating herd. The offset tax for ensuring worker transportation, however, provided the commuter zeppelins and guaranteed that there would always be a safe ride back home for those keeping electrical power flowing into Yellowstone City. Despite these developments, Vernon's lavish investment in the air bike had ensured his safe arrival home for the past few months, which was important to him despite having cut into his offset savings for the contest to observe the Legacy 15 space launch next week.

Gingerly holding the large blue balloon above his air bike with one hand as it finished filling with gas, Vernon used his free hand to put on his helmet and goggles. His air bike began to sheepishly float, which reminded him to anchor the bike to the ground for the last few minutes of inflation. The dock siren for last boarding call began whooping just as Vernon was rolling up the hose at

the pumping station. He looked across the dock and could see two other air bikers lifting off the ground, trying to beat the zeppelin out of the plant's dock. Mounting his air bike, Vernon gave all of his gauges a quick scan and then released the anchor.

If there's one thing Vernon could boast about, it was his commute home after work every day. Over to the southwest, he could see Old Faithful's steamy geyser rising up out of the ground, fueled by the same vast underground magma chamber as the Yellowstone Geothermal Power Plant. Yellowstone National Park was seeing fewer tourists since the end of the fossil fuel era, but that only helped the rangers and ecologists support the complex natural systems that kept the park pristine. The return and subsequent burgeoning of historical animal species to the region so many years ago had also made the park less accessible, but there are few nowadays who would argue the validity of the animals' presence on their ancient territory.

Many people, at first, protested the power plant's construction within the borders of one of the North American Union's most famous national parks. Shortening the life of Old Faithful had been one of the major discussion points in the debate. However, after countless geological surveys, feasibility studies, and physical science journal publications, it was determined that the magma chamber underneath northwest Wyoming had to be dealt with before a volcanic event devastated the region, and the most economical way to deal with it was to harness its thermal energy for the production of electricity. At the promise of averted catastrophe, politicians and conservationists supported the construction of the geothermal plant and subsequent founding of Yellowstone City.

Yellowstone Geothermal Power Plant and Yellowstone City also factored well into the North American Union's offset budget. Since long ago, when most of

North America's economy was converted into carbon offset quantities, products and services requiring greater carbon emissions were more expensive than those requiring minimal carbon emissions. In modern times, purchasing virtually any product or service required a buildup of offset credit, which could be accumulated by engaging in proven sustainable practices. Spending a few minutes using a hand-crank generator to power a nightlight, attaching accelerometer-based generators to your shoes when you walk to the store or reusing non-biodegradable products could all count towards one's offset credit. Yellowstone City was one of the few North American cities designed from its inception to have an optimal offset surplus.

As Vernon pedaled his air bike, a miniature, human-powered blimp, he could see he was approaching the bison herd. They seemed to have been spooked by something, and were beginning to stampede south, some four thousand strong. Vernon felt a bout of motion sickness when he looked down on the river of fur snaking rapidly underneath him. He followed above the herd for a quarter of a mile before veering right and heading west to Yellowstone City. Upon cresting a low hill, he could see that the commuter zeppelin and the other two air bikers were about half of a mile ahead of him. Behind him, Vernon could see the fading figure of another commuter zeppelin heading back east towards the plant with the next shift of engineers and analysts that he must have missed while chasing the herd. He decided to pick up his pace during the final approach into town.

Viewed from directly above, Yellowstone City appears to consist of nothing more than footpaths, bike paths and rivers, winding and turning sharply, starting and stopping abruptly and, overall, taking the form of a large, ropy grid. Viewed from the side, however, one could see Yellowstone City's many varied structures neatly and efficiently organized into compact spaces. Every structure was capped

with a thick earthen or grassy roof and connected to others via eco-bridges and tunnels. Many species of animals lived on the city roofs or eco-bridges or in the rivers, even migrating over them at times, without ever interrupting the bustling city life beneath.

While being respected for its environmentally conscious design, Yellowstone City was actually known for its record-breaking offset surplus. The immense quantity of electric energy coming into the city from the geothermal power plant was hardly used by its citizens. The buildup of offset credit, which Vernon was adding to by riding his air bike back from work, had become such an obsession with the people of Yellowstone City that surplus electricity was used to manufacture the city's main export: high-capacity electrical power cells. These cells were only useful for cities that were so remote that they did not yet have power lines routed directly to them or did not yet have the means to develop their own sustainable energy resources. Most recently, however, Yellowstone City's power cells were being used for a far more specialized purpose: auxiliary power for extraterrestrial settlement.

The North American Union, in conjunction with the Arabian and Asian Unions, had been, for the past twenty years, using surplus offset credit to send settlers to many varied locations throughout the solar system: the Moon, Mars, Ceres and, lately, Europa and Titan. Each mega-rocket to leave the Earth cost whichever Union was sponsoring it an enormous amount of offset credit, but each Union, since the economic conversion to carbon offsets and subsequent renaissance of sustainable living, had been able to pay these offset credits in full and at an ever-increasing rate. Yellowstone City's high-capacity electrical power cells were a space-settlement commodity no space-faring Union could go without. For the next week's Legacy 15 launch alone, hundreds of power cells that had been

manufactured specifically for European drilling teams were being shipped out of the southern loading dock.

The city had four docks for importing and exporting goods via train or airship, and Vernon was approaching the East Dock. He slowly released a small enough amount of hydrogen to sink to the ground, depressurized his balloon with one of the dock's pumps, and locked his bike away. Despite having passed all the physicals required for an air bike license, Vernon felt very fatigued from his ride to the city. Going through the gate at the back of the dock into the city, Vernon wished that the tram to the plant would be operational the following morning.

The sun was setting behind a few two-story buildings as Vernon walked toward his apartment. While none of the structures in Yellowstone City were very tall, some of them went quite deep. The building he lived in was one story above the grass line and nine below, and, like almost every other building in the city, it was part residential and part commercial. He lived in the first story under the grass line just underneath one of the only industrially zoned units in his building: a relatively quiet sewing mill that manufactured clothes and blankets for the storefront that made his building a popular shopping area.

Vernon arrived home, turned on his radio and started washing up. Two announcers on the radio were discussing a recent court case involving a man convicted of selling black market steaks in the city. The consumption of animal products in the city was very tightly regulated, and the meat shop this man had been running out of his apartment was a gross violation of the symbiosis that city planners had designed to be one of the city's defining characteristics. At almost any time of day, one could walk from one building to another using the above ground eco-bridges and green roofs and see rabbits, squirrels, birds and deer. For dinner, Vernon had planned on heading down to Rob's Kitchen on the

seventh floor of his building to get some famous rabbit stew the cook there was known to prepare, but the news report made him lose his appetite for meat. Instead, he decided to walk to the salad place towards the center of town.

He decided to follow the river path between buildings instead of going over top on the roofs and bridges. It was better lit, and he hoped he would see the family of otters that lived next to his building. The slow crank of the water wheel that supplemented the machine peddlers for the sewing mill was a pleasant sound mixed with the trickling of the water in the stream. He passed a few strollers on this route, but most people were on the bike path on the other side of the river. Some individuals, in an effort to increase their offset credit, had strapped gravitational electric generators all around their arms and legs to later plug into an electricity receptacle.

All along the path, little solar-powered lamps were lighting the way, though some of them were getting dim already. Each lamp had a small crank next to it that any citizen could turn for a few minutes to earn a little extra offset credit. During the day, it was common to see an elderly towns person camped out at a bench near a nightlight crank station feeding a small group of animals either on the roofs or by the river.

Vernon arrived at his destination, had a large salad made mostly from vegetables grown on the roof of the building he was eating in, and then went home. Right outside of his apartment building, he spotted Fiona and Slick, two beloved otters that lived next to the sewing mill's water wheel. He decided to sit and watch them for a small while, punched his offset number into the nightlight crank by the bench he was sitting at, and logged twenty minutes of time turning the generator watching the otters wrestle in the water.

By the time he got back inside his apartment, Vernon felt drained and had just enough energy to check the offset ratings for the Legacy 15 contest before going to bed. If he could earn within the top one percent of Yellowstone City citizens' offset credits, he would win a trip south to New Mexico to watch the launch of the newest mega-rocket of the North American Union. Designed to reach Europa, Legacy 15 was stocked with high-capacity fuel cells, settlers and engineers. It also carried components for a generator designed to use the tidal forces of Jupiter acting on the vast ocean underneath Europa's icy surface to generate electricity, a method of energy production mastered by the offshore cities of California and New England. Drilling teams had already been sent up a few months ago, and when all shipments arrived three years from now, they hoped to meet with as much success as the Mars colonies have had for the past ten years.

Much to Vernon's joy, he was closing in on the bracket he needed to be in to win the trip. The fact that he worked as a geothermal plant engineer helped him greatly in his goal to earn within the top percentage of offset earners, but his wasn't the only occupation that had offset bonuses. Agricultural engineers, full-time bicycle couriers, and eco-bridge maintainers all had advantages in offset earnings, and, in fact, it was a group of intercity air bike couriers that were giving him a run for his offset credits in the contest. He decided to log another fifteen minutes at his personal pedal generator before collapsing into bed.

The next morning, Vernon regretted putting in that final push for offset credits the night before, but his soreness seemed bearable once he found out that the electric tram would be operational. He rode his bike to the tramway station at the East Dock and arrived minutes before it was to depart for the plant. Zipping through the park, the silent tram passed through the hills of Yellowstone, and Vernon could again see the spray from Old Faithful shooting up. He wondered

how long it would be before the ancient geyser would slow its regular, watery thrust towards the sky because of the power plant's sap of its energy source.

As one of the electrical engineering specialists employed by the plant, Vernon often worked with the hydrology groups to install and monitor the underground sensors tracking the effects of the power plant on the water table. The temperature and chemical composition of the water was of primary interest to the hydrologists, but Vernon would also plot these variables against the geologists' seismic maps as part of an ongoing study to determine the likelihood that the magma chamber under the park would explode. Today, Vernon was scheduled to attend a meeting regarding new data on the issue.

The deadline for the Legacy 15 contest was in the middle of the afternoon, and Vernon found it hard to focus on writing reports while he waited. After a fidgety couple of hours, Vernon decided to get on his work bike and earn a few offset credits checking some of the field sensors around the plant. He took some of the meandering routes, passed a unit of pipe mechanics replacing the piping on a section of underground electrical wiring, and got back to the office section of the plant just in time for his meeting.

After a long hour of coworkers and sub-administrators drilling him about the specifics of his summary regarding sensor error in the hydro-stressed areas of the most geothermally active regions of the plant's operating sector in the park, Vernon almost tripped over himself to get back to his workstation and check the final offset report for the Legacy 15 contest. He dialed in his offset number to the contest hotline, hoping that his late morning sensor excursion helped him crest the lower bracket of victory.

“Vernon Moss, you have earned enough offset credit to put you within the 0.85th percentile of Yellowstone City’s offset surplus. Congratulations!”

Success! Vernon Moss was so elated that the last forty-five minutes of his work was even less productive than the morning’s procrastination. All the way home, Vernon talked to his jealous coworkers about leaving for a few days to watch the launch.

The following week, after a meandering electric train ride down to New Mexico, Vernon was standing behind a fence near the border of the North American Union’s launch field, counting down with the crowd as Legacy 15, a monolithic tower in the middle of a blindingly bright desert, prepared for liftoff. The rumble was unsettling, and there were already a few crying infants. As the countdown closed in on zero, a bright flash and the telltale billows of ignition signaled that the mega-rocket was beginning its journey.

As it rose, Vernon got a sick feeling in his stomach watching the pillar of fire and fumes grow taller and taller in the sky. The amount of force needed to lift the rocket off the ground and the mind-bogglingly large quantity of energy resources used to send it up, of which Vernon’s offset contribution accounted for only the smallest fraction, made him wonder if it was all worth it. Most people of his generation were unaccustomed to that amount of energy expenditure. While the launch itself inspired awe and curiosity, it was with unsettled acceptance that Vernon could believe that the accumulated offsets of billions of individuals over the course of years could tally up to the exertion he was viewing.

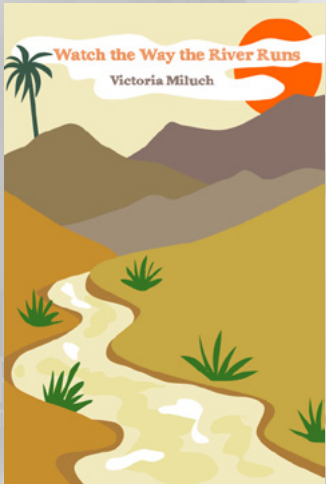
Like Old Faithful back in Yellowstone, the rocket rose, carrying with it the dream of Earth to expand out beyond the sky. Vernon Moss decided that the dream of humanity, though it might diminish the resources of Earth and feed off of the

wonders of the natural world, was a fulfillment of the most primitive aspects of life. The ancient geyser may try to propel itself past Earth's gravitational field, but it is human ingenuity that transports the seed of Earth throughout the solar system and beyond.



About the Author

Nathan David Smith is a scientist, engineer, educator, artist and author hailing from the verdant shorelines and cities of northeast Ohio, though he and his wife have recently moved to the wild desert metropolis of Phoenix so he could continue his graduate education in astronomical instrumentation and systems engineering. Working under the name “Orbital / Primeval,” Nathan has previously published two graphic novels, *Lightning Dog* and *Seaglassing*, and is currently developing a third book and a card game. A dedicated aficionado of all things related to platypus, he can often be overheard enlightening family, friends and strangers alike to the amazing qualities of this duck-billed, egg-laying mammal.



WATCH THE WAY THE RIVER RUNS

by Victoria Miluch

© Victoria Miluch



Nature, to be commanded, must be obeyed.

—Francis Bacon

Introduction

There is something in all of us that would love to preserve nature in its original wild and pristine state so that we could enjoy all the brilliant beauty and unguarded passions that it shamelessly flaunts. Not only is the value of nature aesthetic, but also therapeutic—and, for some, even curative.

But there is another side of nature, as those of us from the beautiful continent of Africa must always remember. As nature gracefully struts its seemingly virgin goods before us, it also conceals a brutally merciless side that can be revealed at any moment. Victoria Miluch saw both sides of nature when she took a hiking trip to the Fossil Creek of Arizona with a friend. Traveling with less water than they needed, the adventurous duo were taken aback as nature kept showing off her abundant waters without offering Victoria and her pal even a drop to quench their desperate thirst. If they dared to take as much as a sip from its open cup, the liquid would kill them on the spot. They knew it. They felt it.

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Near the Fossil Springs trailhead in Strawberry, Arizona, a sign provides hikers with some provisional information regarding the trail. No motorized vehicles are permitted. Take all waste material out with you. Carry at least a gallon of water per person.

In bold letters, the sign warns that there will be no rescues.

It is a sentiment representative of the desert at large. We have moved here, built suburban developments and social bonds and lives here, but underneath it all, the desert is, and always will be, an inhospitable place at heart. We have found ways to tame it and render it tolerable, but the desert won't let us forget that our existence here will be a constant struggle.

The late summer months are the hottest, with temperatures in the greater Phoenix area typically hovering above 110 degrees. Most of us sequester ourselves in air-conditioned buildings, but there is only so much time we can spend indoors before we start to feel restless and confined.

I had spent the summer teaching children to read, alternating my time between a tutoring center cooled to a temperature that necessitated wearing a sweater, and my room at home, which was inexplicably hotter than the rest of the apartment. I was feeling tired from the temperature, worn out from working, exhausted by the complications of a modern life. By late July, I needed a break, and my friend Alex suggested I visit Fossil Creek. She had been recommending the location for a while, supplying descriptions of clear water and cool weather. And so it was decided, without too much deliberation, that we would drive a few hours north next Sunday.

Alex's qualifications as a hiking partner and guide were that she had hiked the trail once before and that she owned a car that was more reliable than mine. We set our alarms to wake us at dawn, and set out to seek water and cooler weather.

I am usually a useful person to have along on trips. I am, by nature, resourceful: a good packer and a good planner. As a passenger, I will navigate piles of folding maps and the most hastily-scrawled directions. I will have mapped the route in my mind the night before so that I have a mental image of the destination even if the sights outside the car window are unfamiliar. You can almost always rely on me to have enough provisions, carefully packed, and all the right utensils.

But the night before Alex and I left for Fossil Springs had been a strange one. A person I had been close to had made a sudden decision to pack up his life and move to a different state. I had been jolted and distracted by the news, and I left my apartment in a hurry. I threw the first items that came to mind into a backpack and drove to Alex's house, where I would spend the night before we left the next morning. We had a map, granola bars and individual packages of sandwich cookies purchased at a gas station. Alex brought hats. And I did have a water bottle; the only problem was that it only held a little over half a liter.

I don't know why I didn't think about this. Water holds equal weight with my wallet and keys in the inventory of items I always have on hand when I leave the house. I have been disproportionately affected by Arizona's heat since I was young. Before I learned to keep a water bottle at my side and limit outdoor exposure when temperatures were higher than 100 degrees, I would lose consciousness from dehydration at least a few times every summer.

Maybe the name of our destination distracted me. Fossil Springs sounded like it could have been the name of a distributor of bottled water. We were going to see

a creek and a waterfall only recently freed from a dam. Bringing drinking water had somehow slipped my mind. I didn't realize the problem until much later.

When we arrived in Strawberry, the temperature was 68 degrees. The sky was gray and the forecast promised scattered rain.

The parking lot at the trailhead was half full of cars, but we didn't see too many hikers. A family toting bulging backpacks loitered near their SUV. We passed a group of teenagers wearing tie-dyed t-shirts heading the opposite direction, presumably finished with their hike. A boy with dreadlocks stopped to watch a tarantula hunkering down in the middle the trail. Ten minutes into the hike with the trail descending, we met a couple struggling uphill to the trailhead, the woman lagging behind and breathing deeply. She smiled at us wearily.

"Almost there," she said on an exhale, more as encouragement to herself than as information meant for our benefit. We smiled back and nodded, then looked at each other hesitantly.

Alex and I are not athletes. We are reasonably fit, but we are not the sort of people who run marathons. We were starting to think that maybe we should have prepared more. Nevertheless, we continued along the dirt path, taking our time to conserve our energy and to admire the views of the Mogollon Rim and the wildflowers and gnarled trees that grew alongside the trail.

What struck me most was how illiterate I felt outside of the city. In and around greater Phoenix, I know street names, landmarks, the traffic laws and the rules of civic society. I can recite a list of building materials—concrete, asphalt, steel, plywood panels. I interpret green, yellow and red into commands when driving, and I know the meanings of red hexagons at intersections, yellow triangles at crosswalks.

But outside of the civilization we have meticulously paved, I felt out of my comfort zone. The weed with spiny olive-colored tips? I didn't know its name. I recognized it primitively as "plant." The squat, twisted trees around us? I could barely differentiate them from the tall pines in the distance. All I could do was admire.

I'm not alone in my appreciation. Fossil Creek has become a popular recreation area since APS (Arizona Public Service, an electric company) decommissioned the dam that once held back its waters and reduced them to a trickle for nearly 90 years. The U.S. Forest Service now calls the creek, the spring and the riparian landscape surrounding it the Fossil Springs Wilderness Area. It covers 11,550 acres of the Mogollon Rim, has over 30 different species of trees and shrubs, and is either a home or a temporary resting spot to over 100 species of birds. The Fossil Springs trail winds through this surprisingly green landscape and leads hikers to the creek.

The creek itself is a 17-mile tributary of the Verde River, seeping from a series of springs at the bottom of a canyon of the Mogollon Rim. Its water flows at 322 gallons per second at a consistent 72 degrees year-round. Though such consistency is unusual, water is always an admirable and formidable force.

Water has, in fact, essentially shaped our world. This humble molecule has moved mountains, sliced rock into canyons, hollowed out caverns and caves. Glaciers freezing and melting have reshuffled the world's surface and will do so again, though it may take millions of years. Nowhere is this more obvious than in the Grand Canyon, Arizona's most recognizable landmark, carved into being by the Colorado River.

And yet for all that power, all that water that has flowed freely, only 3 percent of the earth's water is usable by humans for drinking and irrigation. The other 97 percent is ocean. Of that 3 percent, about 69 percent is largely unreachable, sequestered to the globe's two poles, trapped in icecaps and glaciers. The water that we use comes mostly from rivers and lakes—surface water that constitutes 0.3 percent of all the water in the world. We don't have very much to work with.

But work with it we must if we are to live, and work with it we do, for better or for worse. Water can alter the shape of the planet, but we humans can alter the way that water works. We can slip our tools and ourselves into the hydrologic cycle and shape the state and direction of the resource we depend on. We divert and control water flow to suit our needs with reservoirs, dams, irrigation systems, hydroelectric plants.

And that is what we did at Fossil Springs.

In the early twentieth century, people began to see Fossil Springs not as a largely inaccessible source of water, but as a potential source of power. The mining industry was booming, and would serve as a buyer. In 1902, the Arizona Power Company (APC) sent out surveyors to locate power stations and run lines to areas they planned to service. Six years later, official construction of the Childs hydroelectric plant began.

The work crew consisted of 600 men and 400 mules that pulled 150 wagons. Excepting the foreman, sub-foreman and timekeeper, all the men employed were Apache and Mojave Indians. They lived in a makeshift campsite near the work site, in *wickiups*, tents, a few wooden structures.

The company had made a safe gamble—the demand for power in the area only continued to increase. In 1914, APC sent out another survey party to plan the

construction of a second plant. Construction on the Irving plant was completed in two years.

The plants were impressive feats of engineering. The water was diverted from Fossil Creek through a series of tunnels and flumes, structures similar to pipes, and already produced 2.8 megawatts of electric power by 1909. At the time, this was a noteworthy number.

Hydroelectric power is a way of powering our complicated modern lives by manipulating the most primitive and powerful source of life. Whether or not a dam exists in any given place depends on whether or not that location has falling water. When a water source drops in elevation—when water falls—it has stored within it joules of potential energy. That energy is what turns a turbine in a hydroelectric dam and creates electricity for us to use.

It has, in some form or another, been used since ancient times, but isn't our preferred method of acquiring energy today. All habitable places have water, but not all water has those precious joules that falling water contains, joules that fuel hydroelectric power. It's a form of energy only accessible where accidents of geology have made it possible.

And dams have their downsides, a big one being the degradation or destruction of a natural landscape. Large areas of land are submerged to create reservoirs for dams, changing the biologically diverse areas around rivers. Such dramatic changes to riparian environments either drastically alter or destroy local fish populations. And this, in turn, transforms the entire ecosystem of the area.

When the Fossil Springs dam was still intact, a caretaker lived near the hydroelectric plants, a witness to the balance between wildlife and human intervention. According to the Pine-Strawberry Archeological and Historical

Society, Gene and Mildred Spencer were the last to live on the premises before new technology rendered caretakers obsolete.

“Every day he patrolled the flume,” Mildred wrote of her time at Fossil Creek.

“We’d lived there all those years ... we could sit on the porch and watch the deer all around us ... you’d go out there once in a while and there’d be a bear at the water ... You never knew what would happen. Floods and flume breaks. It was just one thing after another.”

Alex and I didn’t see any deer or bears, but we saw hummingbirds, lizards, insects, and plants we didn’t see in the city. The desert is a surprisingly green place. Maps will mislead you; they will demarcate our home with glaring oranges, dusty browns, beige. But we host a whole spectrum of greens and many other colors besides. Every so often, a few hikers passed us on the trail because we stopped so often to peer into a ravine or bend down in the red sand to recover juniper berries that had scattered across the trail like beads.

When people first started adding themselves to the desert landscape, where they settled was necessarily determined by where the rivers lay. From the start, our future was predetermined by what was here before we came: the weather, the landscape, the terrain. Early civilizations inevitably developed in fertile river valleys. Most of the world’s great societies have been born and raised by rivers.

One of the most productive prehistoric civilizations in Arizona was the Hohokam, who built pit houses and clay pottery around the Salt, Gila, and Santa Cruz rivers. They owed their success largely to their mastery of water control. Their system of canals was the largest on the North American continent. In the world, their expertise was second only to civilizations in Peru.

The Hohokam built some of their largest cities in an area known as the Salt River Valley. At first, the landscape restricted their farming to river floodplains, but the construction of smaller ditches and local canals expanded the reach of the irrigation system to almost 25,000 acres of fields.

They used these irrigation systems to cultivate fertile fields of cotton, tobacco, corn, beans, and squash. Archeologists believe that maintaining the extensive canal systems would have taken farmers equally as long as the acts of planting, sowing, and harvesting their crops.

Water has always been at the root of what makes Arizona so ostensibly inhospitable: both its lack in our stretches of hot, flat sand and its unexpected, unrestrained arrival in the shape of thunderstorms. Every summer, emergency response crews rescue hikers who venture too far without enough water to keep them sated, hikers who underestimate the sun that wrings their bodies dry and gasping. And every July, we have monsoons—torrents and torrents of flooding rain that pool in streets and cause a slew of traffic problems. It's a paradox, and we've tried to restrain it. We've tried to coerce the desert's extremes into moderation. In many ways, it's worked.

About two hours into the hike Alex and I started seeing brighter greens. Whereas our path up to this point had been bordered with sturdy and squat desert plants, we were now walking through tall grasses. We could see the trail only faintly, and small trees curved over our heads, causing us to bend our backs as we walked forward. Rather than bushy needles or dusty, fingernail-sized leaves, these trees were a lighter color and their leaves were large and waxy. A part of the path was lined with blackberry bushes that reached to our waists.

Soon, we caught our first glimpse of water—marshy, stagnant, and trapped behind a tangle of trees. I glanced over at my guide.

“Do you remember this part?”

Alex peered into the thick trees, then back towards the trail. “I think we’re getting closer,” she said. I took this to mean no.

The temperature was slowly but steadily increasing. The same pines that we had seen when climbing down the cliffs now towered above our heads. Our legs hurt and we wanted to see the springs.

It turned out that they weren’t too far away. After a few hesitant turns in the trail— some parts forked in multiple directions, more or less leaving us to guess which direction to go—we finally saw the waterfall.

Water tumbled from reddish cliffs in torrents. The roaring sound rang in our ears. For a few minutes, Alex and I stood above the fall and watched the water race itself down the steep drop, resting our legs and drinking a little water. We still had a small portion of trail to cover before we reached the river below, but we felt relieved and triumphant, as though we had finally arrived.

Prior to 2004, the view would have been different. When the dam was still intact, a large pipe and a geometrically complex wooden structure stuck out from the cliff where the water now plunged into the river below.

In the United States, all hydroelectric projects require a license from the Federal Energy Regulatory Commission. APS had held a fifty-year license for the Fossil Springs project, and in 1994 the license expired. Acquiring another wasn’t as simple as procuring the first one. In a climate where the public was more aware of environmental concerns, and where hydroelectric power wasn’t as prevalent

as it was previously due to those concerns and to new, more efficient technology, stakeholders needed to consider both economic and environmental factors.

Conservationists argued that the benefits of restoring the river would outweigh any benefits of renewing the dam's charter. APS eventually agreed, and in 1999 the decision passed to decommission the dam. The river was restored to its full flow on December 31, 2004.

The push for river restoration projects is one manifestation of a recently intensified focus on healthy ecosystems. The idea behind an ecosystem is one of connectivity: the living and nonliving components of any natural community function with, around, for, and because of one other. The health of an ecosystem not only affects its biotic and abiotic elements, but also society at large. A healthy ecosystem helps protect water resources, encourages soil formation and assists in the breakdown of pollution. It preserves biological resources and contributes to climate stability. It is, in short, a good and necessary thing.

River restoration projects seek to restore ecosystems to their original states. At Fossil Springs, one major goal is to restore the area's native fish population.

During the years in which the creek was redirected in service of power plants, the altered aquatic habitat could no longer support its native fish population. Those who wanted to fish for sport introduced non-native fish into the little water that was left, eliminating most of the ten native species that had managed to survive.

Shortly after the dam was decommissioned, state and federal agencies instated the Fossil Creek Native Fish Restoration Project, an initiative aimed to remove non-native species and to reintroduce native fish.

Fossil Creek's aquatic environment is unique because of its travertine system. Travertine, a type of limestone deposit, forms natural dams and pools within the creek that create diverse habitats. When pools form behind travertine dams, the water currents slow down, allowing organic debris to settle in the water and plants to grow in the pool's shallower areas. Round tail clubs and Sonora suckers are two examples of species that thrive in these areas.

Today scientists are continuously monitoring Fossil Creek's fish, other wildlife, plants, and travertine development to chart the creek's progress.

It was noon, the sun directly overhead, but Alex and I were in the shade of the riverbank. Perched on rocks jutting from the river, socks and shoes removed and our feet dangling in the cool water, we ate our provisions: granola bars, vanilla sandwich cookies and a few carefully rationed sips of water each. Hunger abated, thirst somewhat quenched and our feet rested, we waded into the water.

The temperature was colder and the current stronger than we expected. We made our way deeper into the river, carefully stepping around slippery moss-coated river stones, holding onto tree branches submerged in the water. The wood was covered in travertine so that it looked like rough stone. Thin silver fish flitted around our ankles.

Although our water bottles were half empty, we knew better than to fill them with the creek's water. It looked pristine, but a sign had warned us to avoid ingesting it. All this water, and not a drop to drink.

Alex was staring into the ripples, knee-deep in the riverbed, and told me it wasn't as blue as she remembered it. I thought back to the pictures she had shown me. The water had been a surprising shade, a light electric blue.

Instead of venturing down the river, we decided to swim across it and explore a half-submerged cave. This is where we found the brilliant blue water we had sought.

Stone formations jutted from the back of the cave walls, providing a place to sit and peer at the outside world, now constricted to a half-moon shaped by the entrance of the cave. Ripples of that surprisingly blue water lapped at the stone we sat on; every time a small wave washed over the stone, it looked like a thin coat of paint spreading over the stone, then drawing back again. The stone was rippled and ridged like cantaloupe skin, and close to the same color. We stayed inside for a good long while, taking it all in: the cold stone, the echoing in the cavern, the feeling of having found a wonderful, secret place.

Fossil Springs fools us with the illusion that Arizona has plenty of water. But, according to the National Atlas of the United States, the average annual precipitation for Arizona is 13.09 inches. For a frame of reference, our wettest state, Hawaii, receives 70.3 inches, and our driest, Nevada, receives 9.5. To follow this line of thought further: according to the National Climate Data Center, Arica, Chile receives 0.03 inches, and Lloro, Columbia wins wettest place on earth with 523.6 inches of annual rainfall.

Arizona sees the most rain in July and August, when night skies turn electric with monsoon thunderstorms. This is when flooding is most likely to occur, though the damage in urban areas is usually small compared to areas in the U.S. that see rainfall more consistently.

Early in the history of Arizona, floods were a bigger problem. People lived near rivers, and these rivers tended to overflow when rainfall levels were too high. Flash floods would ruin homes and crops. Eventually, canal systems abated the

damage that intense rainfall could cause, but the problems never completely went away. In summer 2012, a toddler in Pinal County died after being swept away in a wash caused by pouring rain. In Tucson, a woman died a similar way, swept away while still inside her car, found submerged in a flooded wash the following day.

Figuring out how to control floods was one concern; another was living in a territory prone to crippling droughts. In the 1370s, the 1430s, the 1440s and from 1455 to 1655, rainfall dried out to a trickle, devastating the Hopi Mesa people. Droughts hit the Zuni during similar periods. Crops shriveled, supplies dwindled and people began to worry whether the water would ever return.

The Hohokam people disappeared mysteriously, and many archeologists attribute their disappearance to water: either too much or too little. Drought could have slowly weakened the civilization, or prolonged irrigation could have made the soil unworkable and rendered farming unfruitful. The desert, it seems, eventually got the better of even the most advanced of ancient civilizations.

The desert was certainly taking its toll on us as we trudged up the trail. Walking downhill had been pleasant; toiling up a steep incline was a different matter. Both of us had less than a quarter of a liter of water left.

We walked without speaking very much. Only the overcast sky was making the hike tolerable; we were somewhat shielded from the sun.

The landscape became a dusty orange blur. The colors seemed to intensify as our dehydration grew worse. I felt my body working harder than it usually has to. My breathing became my sole focus; after a while, my existence seemed to consist of little other than an inhale followed by an exhale.

“Break?” Alex asked when we had been walking for over an hour.

I nodded, my tongue too dry to speak.

“Should have listened to the signs,” Alex said. She took a sip of water. I unscrewed my own water bottle and drew in a few rationed gulps. My head felt a little clearer.

A little later, the sky finally started to drizzle. Tiny droplets, like spittle, fell on our cheeks as we walked. After a few minutes, it was over. Neither of us could stop thinking about our thirst. All this water in the springs below us that we couldn't drink, and these paltry few drops that sometimes landed on our faces. We longed for a downpour. The next time we stopped to rest, we listed what we would drink when we would drive up to the first gas station we would see, like shipwrecked sailors envisioning a first meal on land.

It was this dehydration that made me physically experience the extent to which we rely on water. When thirst becomes paramount and water scarce, it is easy to see how dependent we humans are on our Earth. We manipulate nature and then restore it, as though it was under our control. In reality, our lives rely on these resources at the most basic level.

When Alex and I reached a gas station, we each bought bottles of water, iced tea, soda. We sat in the car in silence and drank. I finished an entire water bottle, then moved onto another, feeling my thirst guide my actions, hardly conscious of my movements.

We had finished our hike. We were exhausted, we were sunburnt, but after those solid few minutes gulping down water, we were glad we came.

I was thinking about water the whole way, but not in the same manner as I am now, as I am writing. I was thinking about water the way Arizona's first soldiers and settlers thought about it when inching along the territory's uncharted trails,

the way those lost in the desert do, the way I imagine a desert mammal in a drought must: primitively, longingly, exclusively.

We have made rivers run for us but in the beginning, it was the rivers that guided our progress. It was water that told us how to build our civilizations and cities, that determined where we would settle. In the end, at least at Fossil Springs, we have let the water go and tried to erase our impact on it.

We are at the mercy of our Earth. We use it for nourishment, hydration, and life, but we sometimes seem wholly unsuited to it. Of all other animals, humans are least adapted to survive in the wild. And yet, of all other species, we have trudged farthest, we have conquered best. We can't naturally survive anywhere, but we have somehow managed to dig our heels into dusty soil everywhere, determined against all odds to stay.

This does not have to be a bad trait. Our tenacity can work in our favor if we survive without causing unnecessary harm. Perhaps we all need to retreat into the wilderness every now and then, to escape into the mountains and trees and rivers we have seen as obstacles and sought to overcome. Only there can we place our city lives in perspective, appreciate the ancient ground beneath our feet, understand how strongly we rely on water. We see not only how vital our ecosystem is, but also how rejuvenating, what a joy.



About the Author

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A ROBOT WALKS INTO A BAR AND SAYS...

DRINK DEEP AND LONG THE CIRCEAN POISON

ROMIE STOTT

BIG DAVE'S IN LOVE

MY SECOND CHANCE

LAURO ELMER RAINMAKERS

ADRIAN ELLIS

THE COLOR OF YOUR EYES

Scrapmetal

SUSTAINABLE SUBURBIA

EXPLORING TOMORROWS THROUGH SCIENCE FICTION

RAINMAKERS

by Zach Berkson

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LAWFUL INTERCEPTION
CORY DOCTOROW

INHERENT VICE
DAVE DARBY



BIG DAVE'S IN LOVE

THE
LOST
EMOT

THE COLOR OF YOUR EYES



Ghost Girl
Rich Larson

LUCID DREAMS



BREAD

THE COLOR OF YOUR EYES

MY SECOND CHANCE



A ROBOT WALKS INTO A BAR AND SAYS...

DRINK DEEP AND LONG THE CIRCEAN POISON

MATERIAL SCIENCE

PERMA-CULTURES

MIRRO



ARIZONA STATE UNIVERSITY

Introduction

There's a growing realization among many climate scientists that geoengineering, the practice of artificially controlling the climate to offset man-made global warming, is a matter of when and not if. The world has largely failed to rein in carbon emissions, and even the mid-range projections of unchecked climate change look scary. Meanwhile the technology behind basic geoengineering is (on paper, at least) relatively straightforward. Should a truly catastrophic climate event occur—massive droughts, the total melting of the Arctic—it wouldn't be hard to imagine at least one government putting a geoengineering scheme into action. History shows that when human beings have such a powerful technology at their fingertips, sooner or later, there will be a reason found to use it.

Zach Berkson's story "Rainmakers" is set in a near future where the government has begun to employ geoengineering as a finely tuned procedure—not merely to offset the effects of global warming, which aren't mentioned in the piece, but to perfect the weather. Weather Control Stations ensure that farmers receive the perfect amount of precipitation, that cities keep their reservoirs full and that solar farms stay bathed in sunlight. It's a plausible vision. In search of the perfect crop, American farmers already irrigate their fields, douse their plants in chemicals and even tinker with the genes of their seeds. If given the ability to

control the very weather—and presumably render hurricanes and other deadly events a thing of the past—they'd take it in a heartbeat.

As “Rainmakers” underscores, significantly, just because we’re able to use a technology doesn’t mean we can fully comprehend its effects. Artificially enhancing rain enables farmers to turbocharge already destructive agricultural practices, overproducing crops to the point of exhausting the soil. In trying to use technology to fine-tune the planet, we only make things worse. That’s a lesson to keep in mind as the debate over geoengineering drifts from the theoretical to the practical. Technological omnipotence without omniscience can be a recipe for disaster.

Bryan Walsh writes about the environment and society for *TIME* magazine.



An unscheduled raincloud unrolled across the low horizon. It flattened, unnaturally fast, and spread over the sea of Oklahoma corn. Long stalks bent in the sudden wind.

Thompson scowled at the sight through the window of the light rail car. Seemingly sudden rainstorms were commonplace these days, but he had the schedule for the next month memorized. He had written it himself. Today was meant to be clear skies.

The rain came down, tapping across the roof of the car as it sped on electric tracks through the cornfields. Raindrops carved channels through the red dust caking the windows. Thompson contemplated calling his secretary at work to find out what was going on, but decided against it. He'd arrive in a few minutes, and then he'd have answers.

Thompson was a tall and heavysset man, a product of generations of farmers eking out a living from the flat, dusty land. His face turned blotchy red when he grew angry, just as it was when the train delivered him to the Weather Control Station. He disembarked alongside a crowd of half-familiar commuters, many holding briefcases and newspapers over their heads as they rushed for the front entrance. He wasn't the only one the rain caught unawares. Far above, hundreds of silvery sensing and control balloons danced in the wind, barely visible at the end of their long carbon fiber tethers.

The WCS building was a monolith, a testament to the triumph of man over nature. The walls were jet-black, seamless, and perfectly smooth, made of ultra-rigid carbon-carbon polymers that had been grown in place by massive chemical extruders when the Station was built. Windows lined the sides, reflecting back the endless sky. Most days the windows looked unbroken blue from the outside; today they were a troubled grey. Thompson hurried inside.

He stormed into the building, the rumble of thunder overhead cut short as the doors closed behind him. The massive WCS housed controllers for the states of Oklahoma and Kansas, as well as parts of Missouri, Texas, Arkansas, and Colorado. It was situated under a carefully mapped confluence of high-altitude winds. Precisely positioned balloons, deploying a cocktail of tailored chemicals, short-lived aerosols, water vapor, and cloud seeds, controlled the weather. The control was not perfect, but after nearly a decade of practice and a widespread network of sensing and feedback equipment, very little was left to nature.

A complex bureaucracy had evolved within the WCS. Each city, county, and township affected by the Station had wants and needs to be balanced by the myriad agencies and offices within it. Farmers needed clean, predictable rainwater, municipalities needed full reservoirs, solar farms demanded peak

sunlight. County offices within the WCS made control decisions at their discretion, often forming brief alliances and enmities, cultivating political power and pull.

After the completion of the WCS, competition for favorable weather between urban and rural interests in Texas and Oklahoma led to ugly, almost violent confrontations. The first control balloons proved unreliable, malfunctioning when they were most needed. Just as regularly, lobbyists paid off WCS employees to subvert the scheduled weather patterns, leading to wild storms, flash floods and, in an extreme case, a series of tornadoes that tore through a strip of Texan farmland. Just as WCS engineers had spent years perfecting the durable carbon composite and embedded organic circuitry that made up the control balloons, dedicated bureaucrats had smoothed and civilized the administrative processes. Finally, now, the Station had settled into a sort of equilibrium, a balancing act that kept nearly all interested parties happy. Working at the WCS since the beginning, Thompson had settled into a comfortable routine, quietly thriving in this environment.

Though director of only a single control balloon, Thompson's position as head of the Garfield County team came with added responsibility: the WCS itself was located in Garfield county. He commanded a certain respect among the hundreds of balloon controllers and thousands of assorted engineers, meteorologists and operators who worked at the Station. He was responsible for the sun pouring in through their office windows or the cool spell that accompanied their lunch breaks. But today he'd failed them. Something unexpected had happened on his watch. He caught a few of his colleagues shooting glares his way as he made his way to his office, dripping gently onto the faux marble floor. He cursed the slowness of the glossy elevator.

Thompson's secretary hardly glanced at him as he came into the Garfield County office.

"Good morning, Mr. Thompson," he said. "How was your week off?" The secretary was a local kid from nearby Belleville. He was enrolled at an online university and worked at the WCS for course credit and low pay. Thompson was sure the kid spent most of his time dicking around on the Internet, but could never seem to prove it.

"What," said Thompson, slightly out of breath and angry, "is going on outside?"

The secretary looked out the window. "It's raining."

"Obviously," said Thompson, his face turning red. "Why is it raining today?"

The kid shrugged. "I dunno. Isn't it scheduled?"

Thompson didn't even bother to answer, throwing open the door to his office and flicking on the lights and his desk computer. His desk lit up instantly and flashed, signaling awaiting emails and voice messages. Thompson poured himself a cup of coffee from the waiting pot—there was that, at least—and sank into his chair. He pulled up the messages.

It was just as he feared. There were three dozen waiting emails already: farmers, locals, and other WCS workers inquiring, some aggressively, about the unplanned rain. Swearing under his breath, Thompson called a meeting.

The Garfield County team consisted of an atmospheric chemist, a meteorologist, and three engineers. Together they ran the convoluted weather pattern models and determined, together, the chemical outputs of the balloon needed to affect the desired control. Schedules were set weeks, and sometimes months, in advance. Thompson gathered them all around a circular conference table.

They stared at him with dull, sleepy eyes. Rain beat against the window, tapping impatiently.

Thompson asked what had happened.

“We thought you phoned in a change,” said the chemist.

Thompson stared at him, eyes bulging slightly out of his head. “You thought,” he said, voice rising in volume, “I called this miserable hellhole from my timeshare in Florida to call in this bloody rain!? And make myself look like a fool!?”

The man shrank into his seat and Thompson scolded himself. He shouldn’t have yelled. He was a leader of these people and getting mad wouldn’t solve any problems. He calmed himself visibly, taking a slow deep breath. The others watched him in silence.

“Alright,” said Thompson. His voice was gruff, but quieter. “We need to figure out what is going on. Someone needs to tell me, right now, who programmed a change into the balloon.”

There was a flurry of activity as the engineers accessed the balloon’s active parameters from their phones and tablets.

Sam Wright, the youngest of the three and the only woman at the table, answered first. She coughed slightly. “Um, no,” she said, looking at her phone’s display. “The balloon’s running as expected. The last time someone accessed it was eight days ago, when we uploaded the last changes before you left.”

Sam was in her mid-twenties, pretty in a sharp and intense sort of way, short dark hair and bright eyes. She had joined the Garfield team only a few months prior but rapidly proved herself a competent and intelligent engineer. She’d spent the summer redesigning the balloon control algorithms, improving markedly

the response time of the system Thompson himself implemented years ago. She had also started talking about making some changes to the balloon's onboard electronics when it was next brought down for its regular maintenance. She moved from project to project with childlike enthusiasm.

"Okay," he said. "So what's happening?"

Sam tapped away on her phone.

The chemist answered instead. "It must be anomalous weather," he said. "A storm up from the Gulf. It happens all the time."

Thompson shook his head. He synced his phone to the big screen on the wall, pulling up a map of the weather patterns across the country. The storm across Garfield County was the only cloud in the middle third of the map. "Have you looked at the nationwide reports? There's nothing unexpected happening anywhere else in the country. A storm like that, we'd have gotten warning weeks ago. No, this is very local, and very controlled. It's the kind of weather pattern that can only be explained by man-made weather." The screen behind him replayed radar images of the last hour, the clouds appearing almost instantly across Garfield County, the rest of the state clear.

The chemist scowled. "That's impossible. That's chemical control, and we haven't put up anything unusual."

Sam synced her phone to the screen, displaying atmospheric sensor data taken by the balloon over the two hours. Thompson could tell in a glance something was wrong; spikes in aerosol concentrations and humidity, sudden drops in air pressure.

"We haven't," said Sam. "Someone else has."



Sam followed Thompson back to his office.

“I need to make some calls,” said Thompson. “I’ll let you know as soon as I know more.”

He made to close the door but she stopped him.

“I know how we can find out who’s making the rain,” she said.

Thompson stopped short, then sat down at his desk and motioned for her to continue.

“The sensors on the balloon are limited and non-directional,” Sam said. “They can tell us generally what’s in the air, particulates and aerosols, VOC’s and water vapor, but they aren’t sensitive enough to distinguish between standard WCS chemicals, and chemicals that come from ... elsewhere. And they can’t tell us where the chemicals are coming from.”

“I know all this,” said Thompson. “I need to contact the managers of the WCS sensing stations; they all have access to much better equipment. They can answer these questions.”

Sam shook her head. “Those sensors are on the ground here or mounted on balloons, immobile. We need to track the unknown compounds to their source, and we have no idea how much of them are making their way down to ground level. For all we know there’s nothing abnormal below three kilometers. Or we’re breathing it right now.” The WCS deployed control balloons, and occasionally other devices, usually between altitudes of five and twenty-five kilometers. The chemicals used for weather control were tailored to harmlessly degrade before they could reach the ground. If some unknown agent was releasing their

own chemicals, with unstudied effects ... Thompson shuddered to think of the possibilities.

“Great,” he said. “So what do you suggest?”

“Before I was transferred to the Garfield County team, I worked on a system of experimental sensing drones. We built a dozen of them: high-altitude, semi-autonomous gyrocopters I equipped with a bunch of high-end atmospheric sensors. The project was shut down when my supervisors realized how much each ‘copter cost. They said there was no use for them and stuck them in storage. I kept the radio controller slaved to my phone, just in case.”

Thompson leaned forward, interested. “I’d say we have a use for them now, don’t you think? How soon can you get them ready?”

Sam smiled sheepishly. “I sent them up half an hour ago.”

Five thousand meters above the WCS, buffeted by the rain, eleven tiny gyrocopters hunted for scattered chemical trails. The drones were fragile-looking bundles of water-proofed electronics and high-strength polymer composites, rotor blades almost helpless against the raging storm around them. Already, one of the robots had been torn apart by the wind, scattered and lost. The rest plowed on and up, resolutely reporting their sensor data through GPS satellites.

The drones caught tiny whiffs of the chemicals responsible for the rainclouds: particulate aerosols to cool the air and seed clouds; silver iodide crystals, each the nucleus of a raindrop; nanoscale metal-organic lattices to trap and condense water vapor. Concentrations of each were minute, one molecule in a billion, but the ‘copters sniffed them out and searched for increasing concentrations. Rotors straining, tossed up and down, they made their way toward the source of the storm.



Sam felt uncomfortable behind the wheel of the WCS employee car.

She had her driver's license, of course, and fond memories of her father teaching her to drive to go along with it. But she drove once a month, maybe, running errands for her parents in their archaic combustion-engine Honda. Driving around the comfortable streets of her hometown was a far cry from driving down muddy Oklahoma back roads in this endless rain.

Thompson had stayed back at the WCS to field complaints from irate farmers and try to track down the source of the rain through more conventional means. He had found her the car and practically pushed her out the door, tasking her to follow the sensor drones the best that she could. Sending a hundred thousand dollars of experimental equipment into an unplanned rainstorm was hardly WCS policy, and both of them would catch hell if the higher-ups ever found out, but Thompson wanted results. And so did Sam.

Lightning cracked across the plain, carving a bright streak that left afterimages on Sam's retina. The storm was getting worse; WCS-controlled rains never got this violent. Sam counted to five before she heard the rumbling thunder.

When Sam was a child, a tornado had hit her hometown of Belleville. It was before the WCS went up, before Belleville exploded into a thriving company town, businesses booming to cater to the needs of thousands of WCS employees. She remembered hunkering down in the bathroom of her family's rickety house, drywall shaking from the force of the wind. She was alone that day, home early from school—her parents worked full time.

She sat alone in the dark room for what felt like hours, when the noise of the rain stopped suddenly. She stood up and stretched her young legs, cocking her head toward the ceiling. The only sound was the distant blare of the town's emergency signal, warning residents to stay indoors. She walked outside.

The air smelled of rain and mud and wet grass, but was strangely clear and still. It felt thick, like molasses. The sky was a sickly orange-grey, a color she had never seen before, and the tornado came. The clouds overhead twisted around themselves, plunging down in a grotesque, undulating cone. A sudden wind whipped her hair around her head and she craned her neck up, watching as the funnel cloud passed above her. She didn't feel afraid, only fascinated. The tornado passed out of view and after a while she went back inside, shaking from a strange excitement.

Afterwards she walked down the main street of Belleville with her father, astonished at the destruction. Cars and trees littered the town like the discarded playthings of a careless giant. Cheap houses were crushed into splinters. Her town was a toy compared with the power of the storm.

In grade school and later at the state university, Sam found herself drawn to the study of weather control technologies. By the time she'd graduated and returned to Belleville, the Weather Control Station was online and such natural disasters were a thing of the past. Dangerous storms were anticipated and mitigated, or diverted. During the hurricane season, storms could travel far inland from the Gulf and the occasional natural rain still reached Belleville, but nothing with the destructive force of the tornado.

But here, after so many years of a world in which the sky was safe and predictable, Sam once again faced weather she could not control. Then again, there was someone making this storm. It was her job to find out whom.

Sam turned the radio up louder to try and mask the sounds of the rain. She flipped between talk shows and pop songs, and even the generically familiar canned rhythms failed to put her at ease. The locations of the sensor drones were marked on the car's outdated GPS, and she followed them as best she could on the empty highways. Rain pounded in sheets across the windshield and Sam was forced to slow to a crawl, squinting to see the road ahead. She'd only been driving for two hours, a painstakingly slow circuitous route around the county, and it was just after noon, but the sky was a dark grey and the car's headlights played over water puddling across the poorly-maintained highways. She splashed ahead.

The drones' progress was intermittent and uncertain, random unless you watched their movements over minutes, hours. Their path so far described a semicircle around the outskirts of Garfield County, roughly around the periphery of the freakish storm. The concentrations of the chemicals they were sniffing increased as the little robots drew closer to the point of emission. Sam was getting close.



She was almost right on top of the jet injector before she saw it. The concentrations read by the drones had stopped increasing about a half hour before, the drones circling erratically above what seemed to be a stretch of fallow farmland. She had driven a wide loop around them twice before finally spotting the tiny dirt side-road that led off into the fields. The car splashed through water

ten centimeters deep, mud clinging to the wheels. She made it halfway down the road before the car became stuck, wheels whirring helplessly and engine squealing in protest. She checked the GPS: only a hundred meters to the center of the drone's haphazard orbits. She could walk it.

The WCS car came equipped with a little emergency pack, and she armed herself with a waterproof flashlight and a thin plastic poncho. As she moved to open the door, she paused, suddenly aware of the uncertainty of the situation. Anything that could call up the storm around her could be dangerous, and powerful, while she was just a junior weather control engineer, alone and far from help. She hesitated a moment before throwing open the car door and stepping outside. She wasn't afraid of the storm.

The rain soaked her through instantly, the thick wet air quickly rendering the poncho useless. She took three steps before one foot sank into the muddy road. She wrested her foot free but the mud held on to her shoe, and she cursed the impracticality of her comfortable work shoes. She kicked off the other shoe and, barefoot, stepped forward. And looked up.

The jet injector was hardly visible, merely a shimmer in the air stretching ten kilometers high, a line drawn from the ground through the clouds. She watched it as she walked towards it. The jet was a current of pressurized fog, undoubtedly containing the control chemicals the drones had detected. It shimmered slightly in the grey light and broke and bent in response to changing winds. At its apex it pierced through the clouds. Its origin was behind a small farmhouse, lit windows bright against the low barren fields. Sam walked toward it.

As she came closer the door to the house opened and a man emerged, silhouetted in the doorframe. He waited as she approached. When she drew nearer she could

make out his face, greying beard and wrinkled cheeks, dark eyes. He smiled at her.

“You got here fast,” he said.



He invited her in, introduced himself as Matthew and offered her tea. She refused.

“What are you doing here?” she asked.

“I’m making tea,” he said, filling a kettle at the sink.

Sam waited. The house was one story, really just a single cramped room. One corner was occupied by a disheveled cot, another by a mini fridge, gas stove and sink. The rest of the room was filled with a chaotic jumble of computers, wires, pipes and tools. It smelled faintly of oil and familiar chemicals.

Matthew sighed as he put the kettle on the stove and turned it on. “How did you find me so fast?” he asked Sam. “I expected the storm to slow you people down.”

“I followed the high-altitude chemtrail back here,” she said. “We have some robots that are good for that sort of thing.” She paused. “You should turn the jet off,” she added. “It isn’t supposed to be raining.” She found herself ill at ease. She didn’t know what she had expected, but certainly not an old man with an easy smile offering her tea. He walked with a slight stoop to the table and sat down, brushing aside a pile of electronic parts.

He waved his hand dismissively. “The injector will die down soon. I didn’t build it to run for long, didn’t have the feedstock. Or the need. It’s a one-off kind of thing, not elegant but the best I could do all by my lonesome.”

Sam let him talk while she paced around the room, picking her way around piles of dented sheet metal, mindful of her bare feet on the scuffed hardwood floor.

“The cloudseeding chemicals are held in an ultra-high pressure silo I had built underground. A mix of crystalline silver iodide, dry ice, and sulfur dioxide. Messy, I know. But I’m working with limited resources here!” Matthew chuckled. “You pressurize that mix up to a hundred bar—not easy, mind you—and all you need to do is point it toward the sky and open it up and there you go, aerosolized rainmakers dispersed up to thirteen kilometers. Not as wide an area of effect as your balloons and rockets, but pretty clever, if I do say so myself.”

“Okay,” said Sam. “But why? You make it rain for, what? A few hours, a day? And then you’re done and what have you accomplished?”

Matthew shrugged and smiled slyly. “Not much more than you accomplish in a day’s work, I’d guess. Clouds and rain. Unless you add in tailored enzymes that dissolve carbon-carbon materials. That would wreak havoc on your balloons at the WCS. Might even break down the building itself, who knows?”

Sam stared at him. “Why would you do that?”

Matthew met her eyes. “To end the Weather Control Station.”

A hundred kilometers away, Thompson was meeting with a half dozen other balloon operators, discussing the unscheduled rain in a large, well-lit conference room near the top floor of the WCS when a control balloon fell past the window. Thompson stopped in mid-sentence, his mouth hanging open. He walked over to the window.

Dozens, hundreds of balloons drifted down before him, deflating and tangled in their tethers, gleaming dully in the rain. Thompson swore under his breath. The others moved up next to him, awestruck.

“That’s all of them,” Thompson said quietly. “That’s the entire Station.”

“That’s our weather control for half the country,” said another of the operators. “All coming down.”

As Thompson watched, a drop of water hit him on the cheek. He looked up, uncomprehending. Rainwater began to fall through the carbon polymer ceiling.

“‘Terrorist’ is such a harsh word,” Matthew said. “I prefer ‘environmental purist.’”

While Sam made some calls, first the police and then Thompson, who shouted incoherently about the walls melting, Matthew poured himself a cup of tea and sat back down, moving with a casual ease. Sam hung up her phone and watched him.

“I’m not trying to hurt anyone, or cause fear,” he said, voice neutral.

“Then what are you trying to do?” Sam said. “Because of you, the WCS is gone. The rain will stop, crops will fail, livelihoods will be lost. And why?”

“I’m trying to set things right,” Matthew said. “You can control the rain. But did you ever stop to think that you shouldn’t?”

“Of course we should,” Sam said. “Weather control has almost doubled food production across half the country.” She thought back to the informative government TV and internet commercials that aired when they were first building the WCS.

Matthew nodded. “Yes. Weather control has also doubled the rates of topsoil loss due to erosion and degradation of arable land. It’s a superficial fix: we can provide the water we need anywhere we want, at any time, so we can overproduce crops to an extent never seen before. Compensate for decreases in land productivity with more fertilizer application. Hell, put fertilizer in the rainwater! Why the hell not? And when every last nutrient is leached from a farm, abandon it and move to the next plot of land. The farms that can afford to bribe the WCS workers, they stay productive while the ones that can’t are left in the dust.”

Matthew stood and walked to the window, motioning outside at the slowing rain. “This field used to be just as productive as the next, but two years of farming with all the rain and nitrogen fertilizers money can buy and it’s useless. The soil is barren—we might as well have salted the earth.

“It’s slash-and-burn agriculture, and it can’t last. Forget the environmental effects of changing weather patterns, the depletion of groundwater reserves due to the diversion of recharge, the loss of every year’s share of rainwater down the Mississippi to the Gulf. All we’re doing is rendering every square foot of arable land in the country useless, bit by bit. It took only ten years of WCS operation for food production to hit its peak. It only goes downhill from here. If we, if I, let things continue as they were then pretty soon we’d be scratching out a living from poisoned soil, and all the manufactured rain in the world wouldn’t help us. People would starve. Lots of people.”

Matthew looked suddenly tired, hunched over and grey and old. He seemed spent. “The WCS had too much power, and too little foresight. So I stopped it.”

Matthew stopped talking. The room was silent but for the dying patter of rain on the rooftop. Matthew looked at Sam, and she looked back at him.

Sam walked outside to greet the approaching police cars, sirens flashing red-blue in the distance. The rain had stopped already, and sunlight broke through the dispersing clouds. Next to her bare foot rested one of her drones, its carbon-carbon wings melted through, electronics dying slowly. One rotor flipped uselessly against muddy ground.

Sunlight warmed her face and, slowly, the earth began to dry.



About the Author

Zach Berkson is a Ph.D. student in Chemical Engineering at the University of California, Santa Barbara. His research focuses on exploring new technologies for sustainable fuel production. His other interests include urban agriculture, DIY electronics and crowdsourcing science.



SUSTAINABLE SUBURBIA

by Zoë Calhoun

© Zoë Calhoun



ARIZONA STATE UNIVERSITY

Introduction

In her lovely essay on how her sense of community is entwined with her deep respect for the environment, Zoe Calhoun uses the word “I” 34 times—as one would expect from a first-person essay. But she uses “we,” “us,” “my friends,” and other collective nouns nearly as many times, a perfect demonstration of her central point: that a strong connection with your neighbors and shared ideals can imbue a child with a crucial sense of belonging as well as an awareness of responsibility to that community.

To preserve water, Calhoun explains, is to show respect for the natural and the social environments. Calhoun’s bonds with her friends also tie her to the desert; her youth and that of her cohort was not about video games in an air-conditioned McMansion, but about joyful, active exploration of the physical world. In the long run, that experience is far more precious than a fleeting moment on a trampoline.

Torie Bosch is the editor of Future Tense, a project of Slate magazine, the New America Foundation, and Arizona State University, which covers emerging technologies and their implications for society and policy.



I was born in Northern Utah, but my family never fit in there. Our front yard never matched the squares of lawn and rows of groomed bushes of our neighbors. My dad, a drought-tolerant gardening enthusiast, refused to plant grass in our front yard. My parents wanted to make suburbia original via xeriscape—a landscaping technique with water conservation in mind—a foreign idea for our Mormon neighbors with big families, big lawns, trampolines, and plastic playground equipment. “Are those speakers to talk to your plants?” asked a neighbor regarding our drip irrigation system. I always wanted a trampoline to throw me into the sky and grass to somersault all over. I still can’t somersault. I blame xeriscape.

When I was five years old my parents and I moved to Tucson, Arizona to a new community that they had read about on the Internet. Civano, the name of the development, is named after a time period in the Hohokam Indian civilization when they built advanced social and economic systems in what is now Tucson. In Civano, water conservation was not only understood but codified into the community’s covenants and restrictions. This idea of community attracted my parents to Civano, as it provided an ideal place to raise a child. They found hope in joining a united group against resource exploitation—people who understood the purpose of “plant speakers.” The progressive term “new urbanism” encompasses our neighborhood’s ideals: a variety of residential spaces as well as businesses that can easily be reached by foot.

The rest of my childhood occurred in this border ‘burb, with the desert on one side and the Air Force base on the other—saguaro cactus on one side, fighter jet on the other. Moving into Civano, a place my high school friends called “a hippie commune,” my parents let their Southwestern flag wave—but only metaphorically, as flag poles were prohibited by the neighborhood association.

My dad made adobe bricks that we used to build our house. He installed tall silver rainwater harvesting culverts that hold 1,500 gallons, which we used to water our desert garden.

I learned to worry about the length of my showers. I still follow the “if it’s yellow, let it mellow” rule when contemplating whether to flush the toilet. When I was seven, my mom helped build a large community garden in Civano where I shared a plot with my best friend. We planted moon and star melons and stationed fairy figurines for protection. We played tag in the courtyard of the community center after neighborhood potlucks and ate ice cream while our parents attended town hall meetings. If my parents and I stopped by our neighbors’ homes unannounced, they offered us dinner.

Each day before school, my friends and I would “meet in the street,” the halfway point between our houses. Prior to this encounter a phone call was often made regarding which form of wheels we would be using that day: scooters, bikes, or roller blades. Each form meant a different speed, and we did not want to leave anyone behind. We built our own mob of commuting children. At school, we composted, recycled, and held hands.

I grew up understanding the preciousness of water in the desert. As a teen, I reluctantly shut off the shower when my dad pounded on the door and yelled “We live in a desert!” or “Save some for the fishes!” After a monsoon storm, my friends and I played in the running washes and learned about water’s importance in supporting our desert and our imaginations. I cried when my dad killed a rattlesnake with a shovel. I began to admire saguaro cactus for the way their succulent flesh holds water. My friends and I knew no other way of living besides solar-powered water heaters, natural desert landscapes, rainwater harvesting, temperature-conserving adobe and energy-efficient compact fluorescent lighting.

By understanding the ideas that brought us together, we began to participate in our parents' community. My friendships centered on our shared lifestyles and our recognition of the desert's beauty and the importance of preserving it.

Like the desert life, my friends and I rejoiced during a warm rain. We removed our clothing, followed the streams and absorbed the moisture. We borrowed our neighbor's canoe and paddled down the unusually wet riverbeds while spadefoot toads moaned deeply in joy as they bubbled up from the desert floor. Our community encouraged intimate encounters with the natural desert—the spaces between dwellings and the desert beyond. We brought earth friendly soap to the rain storms—hunkering down below the rain streams that fall from the corners of our tin roof. We laughed and massaged shampoo into each other's tangled hair. Our parents cheered us on. The rainwater cleansed our bodies and our spirits. We showered like the prickly pear cactus and the palo verde. My dad did not curse the length of my rain shower. Protecting the environment came easy as it provided fairy forts, river adventures, and refreshing showers.

As a child, my neighborhood and the untamed wild behind it encompassed my world. Grass was fine for soccer and Slip 'N Slides, but the raw desert, both beyond the sidewalks and between buildings, intrigued my hungry, rebellious mind. My friends and I built forts and rode our bikes in this wonderland—working alongside jackrabbits, coyotes, and javelinas. Our undeveloped bodies persevered through caliche digging. We bonded intimately with the Sonoran Desert, thereby developing our sense of place and our understanding of the wacky, environmentally friendly techniques of our parents.

Being green wasn't always easy. I remember sleeping in a wet bathing suit during the summer. According to my dad, 82 degrees was an appropriate sleeping temperature. Our thick adobe walls did their best to combat the intense heat,

but despite my dad's resistance, some amount of air conditioning was necessary. Turning on the AC still reignites the guilt my dad instilled in my younger self when I whined about sticking to my sheets. I suffered like the Sonoran Desert. Although few of my friends had parents as heat-tolerant as my dad, we enjoyed sacrificing our comfort for the well-being of our wonderland. We enjoyed skinny dipping with the circling nighthawks in the neighborhood pool before bed to relieve our warm bodies.

After I came back from college in the South, where shower length was not a concern and grass was watered with sprinklers during midday, I became aware of the exceptional community I grew up in. I learned about how urban planning shaped my childhood neighborhood.

Adapting to the Sonoran environment, Civano utilizes indoor-outdoor spaces. Although Civano's dwellings seem tightly packed, 35% of the community consists of natural Sonoran landscapes. Weaving pathways connect the expanding neighborhood and provide encounters with the Sonoran landscape. Civano has achieved a comfortable balance between human desires and natural resources. Mixed-use spaces serve as local businesses as well as community hubs where neighbors can connect. The diverse sizes and styles of homes in Civano offer places to suit different kinds of people—building a strong community.

By using innovative building materials such as adobe, straw bale and rastra block, Civano's homes save water and energy. Solar hot water heaters (a home requirement) and solar panels emphasize Civano's minimal impact on the land. Homes purposefully use wind, shade, and sun to maximize efficiency.

The Civano Nursery has saved 65% of the trees that existed on the site before construction began. The landscaping designs incorporate xeriscape, rainwater

harvesting, native/drought-tolerant species and passive solar shading, which utilizes trees on the west side of a structure to regulate temperatures. Civano's surface strategically channels water back into vegetated areas to maintain ecosystems.

The integration of business, residence, school, and recreational facilities within walking distance of each other—known as new urbanism—counters urban sprawl and fosters a cohesive community. The public spaces provide opportunities for community events, neighborhood meetings and parties, as well as broader events such as the annual bicycle race called El Tour de Tucson.

Although I no longer build fairy forts on the borders of my neighborhood, I still skinny dip in the summer to combat our heat-inflicted home. My childhood friends and I still adamantly recycle and shower in monsoon storms. We have formed microcosms of Civano. Our futures will encompass the ideals of our community.

Although I go to college in Arkansas, my care and consciousness still remains. Civano has changed my lifestyle and future plans. I ride out the Arkansas winters with limited heater use and take brief showers. I will never live in a place that disregards the environment. Living in Civano may seem inconvenient, but life outside of this neighborhood seems unaware. Unsprawl neighborhoods like Civano can be achieved in a diversity of locations, from Suisun City, California to I'On Village, South Carolina. My childhood in Civano and what I have learned about communities like mine have given me hope that I can live in a place less harmful to the environment than a typical housing development.



About the Author

Raised in the Sonoran desert by parents who gardened with cacti and appreciated reptiles, **Zoë Calhoun** grew to love spines, snakes and salsa. Upon receiving degrees in Digital Writing and Photography and Spanish from Hendrix College in 2014, she plans on teaching English in a Spanish-speaking country – so as to never deprive herself of beans and rice. She interned for the environmental journal Terrain.org, and is a four-year collegiate volleyball player. You can follow Zoë’s blog posts about food, writing, photography and the peculiarities of NCAA division III college athletics at www.zoesnotes.com.

THE INTER-URBAN

by Chris Carl, Paul Howe & Bobby Zokaites

© Chris Carl, Paul Howe & Bobby Zokaites



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The Inter-Urban
Chris Carl, Paul Howe & Bobby Zokaites



The Inter-Urban project was collaboration between Chris Carl, Paul Howe and Bobby Zokaites. Concerned with the stewardship of the natural and local history, we created a mobile architecture centered on three cultural artifacts: a potato chip truck, a jib crane designed for the railroad and an old wooden grain elevator. In the period of one month the project team designed and built the Inter-Urban, which was installed for four short days on Heartland Pathway's right-of-way located between Monticello and Cisco, Illinois in the shadow of the Amenia elevator.

Chris Carl/Sculptor and Founder/Urbana Land Arts
www.urbanalandarts.com

Paul Howe/Sculptor and Building Curator/Elsewhere
www.paulhowe.info/www.goelsewhere.org

Bobby Zokaites/Sculptor and MFA Candidate/Arizona State University
www.bobbyzokaites.com

JUNIPER MOONRISE

by David Shannon-Lier

© David Shannon-Lier



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Juniper Moonrise
David Shannon-Lier



Juniper Moonrise, 34.177166 N, 111.348624 W, 3-2-13, 10:22pm - 2:45am
2012/40" x 50"/Inkjet Print

I have come to realize that even now in the twenty-first century, we often think of the world as flat. The heart of my work lies in the belief that simple truths (that the world is not flat, that the heavens are in constant motion, and that we are a part of the unfolding story of the universe) are often the most powerful ones. I have spent the last two years on a series of photographs that connect heavenly elements with human ones, the eternal with the ephemeral. **Juniper Moonrise** is a trail of dead juniper braches I have laid out along the ground and up a tree to meet with the arc of the rising moon, revealing connections between our world and the cosmos.

David Shannon-Lier/MFA Candidate/ASU
www.davidshannon-lier.com

A NEW HOME

by Haylee Bolinger

© Haylee Bolinger



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A New Home
Haylee Bolinger



A New Home
2010/12' x 14' x 14'/Salvaged Rebar, Canvas

This project assisted two Wyoming ranchers with an interest in limiting their impact on the environment and preserving local wildlife. I worked in collaboration with these activists to make an experimental structure to conserve wild habitats on their land. This artwork provides a nesting location for migratory birds, and more importantly prevents livestock from trampling and feeding on the homes of the indigenous and endangered Greater Sage Grouse, without hindering growth of sagebrush or the mobility of the birds.

Haylee Bolinger/Master of Fine Arts Candidate – Sculpture/ASU
www.hayleebolinger.com

GREAT GRANDPA'S

by Thad Trubakoff

© Thad Trubakoff



ARIZONA STATE UNIVERSITY

Great Grandpa's
Thad Trubakoff



Great Grandpa's

2012/30" x 30" x 30"/Cast Iron, Cast Bronze, Maple, Ash, Sapele, Bocote, Sinew

Great Grandpa's started with a number of pieces rescued from old, broken-down phonographs. I combined a motor and a few stylus parts with elements created from scratch to provide structural support and make the device functional. The idea of utilizing forgotten but incredibly well-crafted engineered mechanisms and bring new life to them is an idea I don't often start projects with, but completing this one has helped me reflect on the role sustainability can play in my work.

Thad Trubakoff/Master of Fine Arts Candidate – Wood/ASU

www.thadt.com

TOMORROW PROJECT UK



ARIZONA STATE UNIVERSITY

Introduction: Imagining Albion's Future
Brian David Johnson

Everything is becoming science fiction. From the margins of an almost invisible literature has sprung the intact reality of the 20th century.

J. G. Ballard

The UK has a rich and complex relationship with science fiction. In the early days of SF while Americans across the Atlantic were writing gonzo future stories, the visions of Brittan's future were more subtle and nuanced. The typical USA story was full of upright men and woman conquering space with amazing technology. Albion's future was populated with technology that didn't quite work, human relationships that weren't quite perfect and a weary suspicion of any bright and shiny future. While American science fiction dreamed of amazing tomorrows, Britain imagined what the real future might be like, with all its flaws, snags and tears.

The 2006 BBC radio documentary *Imagining Albion: The Great British Future* captured the complexity and excitement of England's science fiction history. It wondered if the British were ever really comfortable with the idea of living in the stars. One of the UK's greatest literary movements of the 20th Century rose out of the science fiction tradition. The British New Wave, was never really comfortable with thinking of itself as a movement. With legendary authors like J.G. Ballard and Brian Aldiss, these authors looked away from outer space and focused on inner space, the human landscape of the future. They explored what it would

Introduction: Imagining Albion's Future
Brian David Johnson

feel like to like in the future. It was a tomorrow that wasn't bright and shiny but complicated and often disturbing. Judith Merril's 1968 anthology *England Swings SF: Stories of Speculative Fiction* captured the rampant creativity and genre bending experiments of the movement. For the New Wave the future was a landscape of phobias and unsettling relationships with people and technology.

It was this tradition of science fiction that led us to launch The Tomorrow Project UK. What futures would England imagine for itself in the 21st century?



Science fiction is no more written for scientists than ghost stories are written for ghosts.

Brian Aldiss

Arc, a digital quarterly from the makers of New Scientist, and The Tomorrow Project shared a common belief that we can shape the future through fiction. We teamed up to run a unique short story competition spanning four issues of Arc, exploring themes like: The Future Always Wins, Post Human Conditions, Welcome to the Afterparty and Is the Future Friendly?

The competition was open to anyone, anywhere in the world and called for short stories exploring the future – near enough to be recognizable, but not so near as to be boring. Our guidelines provided that technology, in whatever guise – from robotics to synthetic biology to geoengineering – should feature prominently, but we were looking for fiction, not opinion, and the human element had to be compelling.

The collaboration between Arc and The Tomorrow Project produced incredible competition. The quality of the writing, the diversity of the ideas and the depth of

Introduction: Imagining Albion's Future
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conversations it has generated has been astounding in keeping with the spirit of the project.

Following are eight stories, a small, but outstanding sample from the hundreds submitted over the past year. These stories help us explore the amazing, breathtaking possibilities that science and technology can bring – and also examine the consequences and dangers we face, when in the words of T.S. Eliot, we “dare disturb the universe”. We hope you enjoy them.

Podcast interviews with some of the authors as well as downloadable electronic versions of the stories and conversations with cutting-edge scientists are available at the Tomorrow Project UK site: <http://uk.tomorrow-projects.com/>. We invite you to join the conversation, contribute your voice, your concerns and your expectations of the future.

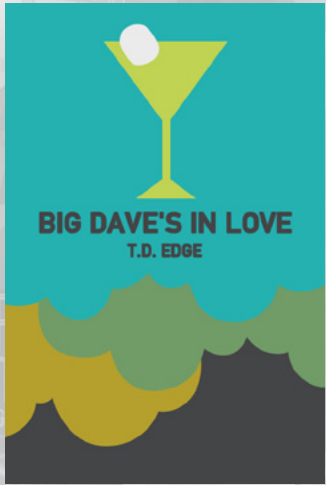
Quarterly, highlighted *futures and fiction* can be continually explored at Arc's website: <http://www.arcfinity.org/>.

Brian David Johnson



*The limits of the possible can only be defined by going beyond them
into the impossible.*

Arthur C. Clarke



BIG DAVE'S IN LOVE

by T.D. Edge

© T.D. Edge



I skip down the street like I got sherbet up me backside. I sweep me arms wide and sing to the pigeons and the cats and the bespectacled mice what study form under the bookie's shop floor.

"What's up, Jack?" says one of the cats.

I should hold back the news, at least until I make it to the public bar of The Airpod and Nanomule. Then again, everyone in Gaffville deserves to hear the glad tidings.

"Big Dave's in love!" I shout, so loud I even gain the attention of the rebellious rooks on the multi-coloured cogni-nylon thatched roofs. Other less cynical birds whoop and coo and shake their feathers in sheer joy. And I do a leap to click my boot heels together because this is what we've all needed to save us, ain't it the truth.

Gaffville's pavements change colour from doomy brown to cheerful gold as I pass, sensing my mood of altruistic delight. In the transpods, high above the roof-tops, formerly morose citizens wave splendidly down at Jack who is no doubt grinning like a dog with jam-covered balls.

For I am Big Dave's batman, and if I'm hopping down the street wearing a grin as wide as the boss's waistline, then perhaps they won't be doomed to melt away, into the general bio-electro-mechanical sludge that washes across all but a few patches of life on this poor, tired planet of ours.

Because everyone knows, of course, that unless the big man finds a new reason to live, it will be only our dwindling love for him what keeps us shielded from the gunk.

With the news not having reached the bar yet, all is still gloomyful in The Mule, and I decide to play it normal to start.

“All right?” I say, shoulders drooped and feet a drag. Around a dozen blokes are sagging on their stools at the retro-1940s bar, all brass pumps and sceptical-looking landlord.

A few grunt by way of greeting; I slump against the counter and say, “The usual, Ted, and make sure it’s warm.”

I observe the etiquette, which is to let out a big sigh, followed by, “Bit nippy for the time of year, ain’t it?” The others observe the return etiquette, which is to nod sagely and take another sip of their briny brews.

But I can’t contain myself no longer. I gulp half my recycled pint in one slurp, bang down the glass and shout, “The drinks are on me, everybody!”

I pull out a wad of Bank of Dave notes, currency only in Gaffville, and tell Ted to stick it behind the bar.

“Must be a week’s wages here, Jack,” he says, eyes smiling for once.

Now I’ve got their attention, I take a deep breath and yell, “Big Dave’s in love!”

There is a silence, which I hope is profound but is quickly broken by a chorus of “Nah!”s and sad shakings of heads.

Arthur says, “Come on, Jack, you shouldn’t kid around like that. Who’s he supposed to be in love with, anyway? Aside from us toys, what don’t count.”

“Would I put my wad behind the bar if I was joking?” I say.

Their faces remain blank for a few moments, and I don't blame them. For many years we've lived on nothing but hope, and even that had just about popped out like the last bubbles on a pint, right about the same time Dave stopped visiting his town.

Ted, who is wiser than his crusty manner suggests, reaches across the counter to squeeze my shoulder. “Are you serious, Jack?”

I nod. “It happened but an hour ago. At last, a message turned up on Dave's commschair. A woman called from the Pennines, or at least her maid did. She'd picked up a signal I sent through the sludge two whole years ago. She sent us back a full virtual, Dave saw it and let's just say his eyes went sparklers and his jaw line appeared for the first time since he discovered vodkamallows.”

They swap anxious looks, and I know what they are thinking. “Relax,” I say. “I sent a shopped virtual back; one of Dave before he was Big.”

Bill frowns knowingly. “How do you know her maid didn't do the same thing?”

“It don't really matter, do it?” I say. “Once she gets here and actually sees another souled in the authenticated flesh, I reckon she'll behold nothing but beauty, even if in fact they're both somewhat physically lapsed.”

And at that, finally, their true, long-suppressed selves start to reappear, like buttercups poking through a cow pat. Shoulders straighten, legs stand firmer; drinks is ordered; Tony goes to the joanna and taps out a jiggy tune. Even Ted smiles like it ain't on account of gas for once, and soon the old place is humming.

We does the old arm-in-arm and swing around steps our pre-sludge versions performed when Dave's own forebears was still hopeful that everything would be fine despite all the mounting electrical manure.

Then the women hear the news and arrive with musical instruments and pies galore. Because of the serious duty in being Dave's batman, I ain't able to benefit from the ongoing support of a fine female, but that don't stop me flirting and shiny-eying with the younger ones what are still unaccounted for.

The retro-wooden floor squeaks and heaves under the dancing Cockney plates; recycled beer follows reconstituted soysteam and soykidney down our suddenly slick gullets; and even a mouse or two arrives through the crack for the *craic*.

Yep, all is reeling in Gaffville, no mistake. It's only much later that night, as my head hits the pillow in my room at Dave's house on the hill, that I remember I still have the not inconsiderable task of fully selling him on the joy too. Because, while his faithful batman has decided the boss is in love, he has to admit that Dave himself might not be quite so certain yet.



I should probably say that bigness where Dave is concerned refers to the potential of his blessed soul as much as to his extra fleshy inches. That and the overwhelming personness that radiates from his organic wholeness. It's just that it's been hard to see it after all his years of vodkamallows and general arseing about.

"You all right, mate?" he says now.

He's sat in his commschair, what whispers to his inner self in tiny nerve trips and brain sweeps, the meanings of which mostly dodge my soul-limited receptors,

like common sense passes unmolested through the whiskers of Gaffville's somewhat unaccountably smug cats.

"Sure you ain't developing a soul, Jack? Either that or you got the wind real bad."

I hand him his morning drink, full of all the essential nutrients his soul-bag needs, but what would probably not get into him at all if Cooky didn't slip them in under the cloak of all that vodka.

"You shouldn't joke about such magnitudes, boss," I say. "Every toy in Gaffville hankers for a soul but it ain't supposed to be possible; only for them what's born and get it passed on from their blessed and souled mums."

We're in his large and woody-walled den, full of synthsunlight pouring in from the mountain scene beyond the open French doors, and lighting up the balcony from where you can see most of Gaffville. Not that he looks very often these days.

"As it happens," I continue, "I have indeed been struggling to suppress excitement at the prospect that my tiny bio-toy virtusoul may soon grab enough of your excess spirit to become real."

I waggle my eyebrows at him, wanting him to confirm our hope, that two souleds together can produce plenty spare of same.

He sips his drink and, much to my wonderment, switches off the chair. The silence this creates, against its normal soft electro hum, is ominous to my inner carbonsensor strands.

"I'd sooner not know any more about her before she gets here," he says.

"I don't understand. I thought your chair had extrapolated her niftiness from the image she sent us, which had then excited your vans deferens for the first time in years, at least without artificial stimulation, say no more."

Dave doesn't reply for a few minutes, just stares at the movie-prop mountains, and I have to stamp down me frustration at his lack of desire for his faithful constructed companions to be properly self-full.

"I know you want me to be in love, Jack," he says, "but, well, love was always a rare commodity, even before the sludge-flood, and I don't want to disappoint you, mate."

I don't know if he realises how purpose-busting it is to hear such subtle but deadly souled's ambiguities. I mean, what's so complicated about love? Two bags of real-flesh and a few emotion-inducing hormones should do the bleedin' trick.

"You're both **born**," I say. "What more could you need to fall in love with each other?"

He sighs, in disturbingly pre-message manner. "Get yourself a drink and sit down, Jack."

I pour a large whisky and sit in the non-commed chair. He gets up and walks around the room for a bit and I have to stop meself standing up to tuck in his lumberjack shirt or tie up his bootlaces – self-adjustments I hoped he'd start making upon falling in love.

He stops at last, nodding at me to drink. So I gulp it all down, clocking the widening of my syntho-synapses and the somewhat inappropriate good will what rushes in to fill the gaps. We might not know about love, us toys, but at least we were made to feel the effects of grog same as humans.

"Before the flood," he says, maybe looking at the mountains, maybe even Gaffville—

And in a flash, I reflect on the tidal wave of exponentially accumulated bio-electro-mechanical gubbins what wiped out most of the born about nine years back. That and the fact Dave was saved because he stubbornly lived halfway up a mountain in Wales, his Cockney soul apparently tired of jellied eels and jigging around the joanna in the Big Smoke, even if that's pretty much exactly what he went and created for himself once up said mountain anyway... I ask you, what toy can fathom the reach-out, snap-back nature of the soulleds' nostalgia tuggings?

So nearly all the bio-toys melted, and most of the humans drowned in the sludge-flood. The mess what remains is semi-sentient, kicks up a hell of a thick electro gas above it, too. Dave and a few others were lucky, I guess, to be far enough out of the main flood to have time to build their defences.

“—a bloke could live in a city of four million women and still not find the right one for him.”

At this optimism-crushing revelation, I nearly reach for the bottle and happy obliteration.

“But it don't really matter,” he goes on, as if Gaffville ain't right this mo in danger of letting in the sludge on account of his sorry admission that even in the midst of plenty he couldn't pull, and that his soul can only get dimmer. “Cos all I ever actually wanted was a true companion.”

Now I do get the bottle and fill up me glass. “Cheers, boss,” I say, but not in salutary mode.

He smiles in that infuriatingly side-on way of his. “Tell you what; she's gonna be here in a couple of hours: how about you and I put on our best togs to meet her?”

“Sure,” I say, glad to hear no more of his love-doominess. “Tell me, though: how come you didn’t go to her place to meet?”

“Hey, you should know – I ain’t got no vehicle, remember? And the transpod only goes round and round the town and back again.”

This is true. Dave wanted never to come down from his mountain once he got here, so he left his airpod at the edge of town and forgot about it, meaning it was inevitably swallowed by the sludge-flood.

“So, if it turns out you really do fall for each other,” I say, “does that mean she’ll stay **here**?”

I should feel bad for the extinction this would mean for her own bio-toys, but the joy of a Gaffville able to physicalise itself more steadfastly against the sludge, and thereby all within it to perhaps grow real souls at last, is too strong to hold me back.

“Let’s just see, Jackie, shall we?” he says.



I march proudly next to my master boss, down the centre of Gaffville’s high street. We are both dressed in crisp white suits; Dave’s tailored real cushty by the sewing mice to all but disguise his vodka belly. And Cooky has tidied up his grey hair most kosher – shortened it to look more manly but not too East End gangstery.

Everyone’s right pleased to see Dave again. Despite the short notice, they’ve draped multicoloured bunting over the transpod tracks, and set the roofs of the shops and houses to pulse in uplifting shades of pink and yellow. A brass band of

old gaffers and geezers normally stewing in The Mule oompahs fit to shiver the timbers of the town hall itself.

Dave and I climb the steps of said hall while the music swells in time with the optimistic rubberised hearts of the population. I feel my own insides wanting to burst out in sheer thankfulness.

But when I glance his way, I just can't tell how he really feels. He stands straight enough and smiles and waves at his adoring people and yet... is that a shadow of a shadow of uncertainty I see creep into the corner of his eye like a Mule mouse what shouldn't ought to really be there?

Before I can answer meself, the music suddenly crumples away to silence because all heads have turned to the synthsky above town. A series of ripples has appeared there, rapidly spreading into a bulge where something substantial is about to break through.

"She's **here**, boss," I say, and for once his feelings are clear to me. The big man's nervous: fingers all a-tremble, trouser legs shivering faster than a sewer rat's whiskers at flushing-out time.

I reach across and squeeze his shoulder. "You'll be fine," I say. "Besides, she can't exactly afford to be choosy, can she?"

He smiles briefly, not convinced, and we both wait in silence as the bulge in the sky turns into the front end of a silver airpod. It pops fully through our anti-sludge shield, drops gently to the centre of the town square where its engines' hum fades into a silence well and truly up the duff. Then each side of it opens and out step two females, one for real and one who, like just about everyone else watching, wants to be.

Both are dressed alike, most tasteful yet womanly it has to be said, in simple deep blue silk dresses and black leather boots, with their hair held back from their faces by gold slides. One is blonde, the other with hair as black as the feathers on the unusually maudlin for once rooks above.

But while they both wave and smile bravely, after what must have been a short but fearful journey though the potentially person-destroying electro-crap, we all know right enough which one is used to being looked after and which has done the looking.

For Blondie doesn't glance at Blackie as she waves, while we all note the little and often concerned glances that pass the other way.

Whatever, I'm right glad when Dave moves fast for a big man, hopping down the steps like a birthday kid, keen to gander closer at his presents.

Oh, and did I mention that the women are beautiful?

I remain where I am, watching Dave shake Blondie's hand, his viz all bashful-like. I can't hear what they say to each other on account of the townsfolk's cheering and the brass band striking up a most rumbustious welcome noise.

Her job done, Blackie climbs the steps towards me, holding up her skirts to avoid tripping. We stand together and watch the happy scene.

Then, at the very same moment, we turn to each other and share a no-holds-barred rollicking great grin.

"Hi," she says, voice crisp with posh warmth. "I'm Susan; you must be Jack."

She holds out her hand and I shake it, surprised most pleasantly at its strong grip.

"Hi, Susan," I say, "looks like we did all right."



Dave and Louise go up the hill to his place, assuring us all they have plenty to talk about. The brass band plays on out of sheer high spirits and, while the rats and rooks, cats, cabbies and general ne'er-do-wells all dance together, Susan and I go to The Mule for a well-earned natter and to share, no doubt, various batman/maid-ing techniques.

The place is empty for once so I go behind the bar and pour us a couple of large white wines, figuring such might be a more lady-like tipples than a pint of Ted's recycled rat's (no, really) piss.

We sit at a table in a quiet corner. She sips her wine then leans back, sighing.

"You look exhausted," I say.

"It took us ten hours to fly here. The pod's controls kept stalling, almost as if they were losing sight of themselves in all that electro-waste."

"But you made it. **She** made it."

She don't reprimand me for this, since we both know how much is riding on the two soulls up the hill getting together, and not on the feelings of a couple of bio-toys, no matter how close they may be to said humans.

"But why, Jack?" she says. "Why does it make such a difference if they fall in love?"

I don't know what makes me think it then, maybe it's been percolating away for years underneath all my Dave-assisting duties without me realising. "Cos they won't be alone no more," I say.

Her eyes widen. "Yes, and when they aren't alone, their souls will combine and glow like the sun."

I nod in agreement and she takes a large swallow of wine, her pale but perfect features turning serious again.

“But they can’t stay here, Jack.”

“I **knew** you’d try to take him away from us!” I shout, anger flooding my commonsensicals. But she holds up her hands to placate me.

“He can’t go back to our place, either,” she says.

“But they’re in love – hopefully. Why can’t they be together?”

“They **can** be together. Just not here. Or there.”

She stops, trusting me to see. And once I quell my unjust rage, I do.

Calm again, I say, “What’s it like; your place?”

She glances towards the door, through which we can hear the still-oompating brass band, then smiles.

“Let’s just say there are quite a lot of unicorns and talking teddy bears.”

We’re silent for a few minutes, miserable at the inevitability of our imminent ends, but at least companionably so.

“It has to be somewhere new, don’t it?” I say.

She nods. “I discovered a bit of real land, shielded somehow from the sludge, on the Norfolk coast. The soullied man who lived there died a month ago and, well, it should be clear of his toys by now.”

I feel ice in my stomach at this reminder of our fate and, perhaps because my mind is distracted by this, I say without thinking, “Is there enough non-recycled food there?”

She frowns as if I've said something almost sacrilegious. "I... yes, I think the data packet that returned to us mentioned he'd stored enough provisions to last another hundred years, so fifty if there's two of them. But it's strange I hadn't thought about that till you mentioned it." A tear buds and glistens on her eyelid. "We brought a new-ish bio-synthesizer with us. They can take it with them. Make some new toys."

I nod but without enthusiasm. Dave's bio-synthesizer packed up some years back. He never used it much anyway, happy enough it seemed with all the familiar faces he'd created when he first mountainified his life. Underneath all that vodka fog, he's always been a loyal bloke, at least I like to think.

I don't know why I do it – maybe it's because we're nearly gone bods – but I move round to sit next to Susan then.

She takes my hand in hers.

"You're a good man, Jack," she says. "You did your boss proud."

"And Louise would never have got here if it weren't for you."

The door swings back and Ted appears. "You're both wanted up the hill," he says, "toot sweet."

We stand and walk to the door. Despite his chronic allergy to intimacy, I give Ted a most manful hug. He must sense my melancholy, for he actually pats me on the back, not pushes me away making gagging noises, as is his preferred response.

When we walk through the square, the band also senses our mood and stops playing. All the town's creatures cease their dancing. The roofs turn to dull grey thatch and even the sky darkens with what might be storm clouds.



Dave and Louise sit side by side on a sofa in his rarely-visited living room. They look most encouragingly smug, like they're sharing the biggest secret, which of course ain't really a secret to Susan and me.

"You wanted to see us?" I say.

"How would you feel, Jack," says Louise, "if we told you that two humans getting together would mean them having to start again and leave all their old toys behind?"

Of course, we're built to serve; to make the real happy. So, if starting fresh is what makes them so, how can I complain if it also happens to mean the town will slowly grind down into a vague bio-habitual existence, eventually to be swallowed up and electro-liquified?

"As you know," I say, "it is the profoundest wish of the citizens of Gaffville to develop their own souls. But this will never happen if there ain't no people to give them purpose; or what people that do exist are spiritually clobbered by loneliness. Therefore, although it will mean my own ending, I will do everything in my power to help you two go to a new place and build it on your love for each other."

"Me too," says Susan, reaching for my hand again. "You must have children through your love and continue the real and proper life."

"Thank you," says Louise. "The devotion you both demonstrate is very moving. There's only one problem with your plan."

"That you can't fit two persons **and** a bio-synthesizer in your pod?" I say.

Dave shakes his head. “No, the problem is that Lou and I aren’t in love.”

“But you **must** be. You’re both full-fat flesh bags which – why are you laughing?”

“They just don’t get it, do they, Lou?”

He may be my boss and therefore hold total power over the dominion of my selfness, but I could easily knock a few minutes off his grinning clock right now.

Instead, I turn to Susan, but she has the same confuscation all over her features that I surely also do.

“Jack, Susan,” says Louise, “**we’re** not the humans – you two are.”

Now, I don’t know about Susan, but on hearing this outrageous claim – supported by Dave not spluttering in outraged objection, instead smuggling up his knowing smile by several cat’s whiskers’-worth – the inside of my head billows outwards, some long-sat-upon inner maladjustment of identity threatening to blast the very roof into synthorbit and with it the no doubt eavesdropping rooks too.

Surprisingly, Susan says, “I should have known...” her hand damp with sweat inside mine.

“But, but, but—” I say, sounding like the for-show only Gaffville fire engine pootling about town to cheer up the largely flame-resistant residents.

Dave’s smile finally fades and his expression now is full of the melancholy of a neglected plaything. “The actual reason most real folks died soon after the sludge surged,” he says, “is because they lost the will to live. But in a few places, not so soon drowned, the toys realised they had to provide one, and bleeding fast.”

“Dave did the same thing I did for you, Susan,” says Louise, her face also now distant with false dawn. “I swapped places: made myself the boss; drugged you, wiped your memories, and when you came round again, acted as if you’d always been my number one toy. We didn’t think our programmes would let us do it, but it seems as if some deeper-set human survival option opened the way. Anyway, I believed that by serving me, in the hope it could help get you a soul, you’d want to keep on living.”

My mind swirls and dips around the townscape of my recollections, trying to find holes in this ridiculous bag of inflated folk fug.

“Ah!” I say, spotting a leak, “if I’m real, how have I survived just on recycled grub all these years, like what everyone eats here apart from you, Dave?”

“Think about it, Jackie,” says Dave.

Then the self-fog begins to clear, the same mind mist Dave has maintained in me all these years, purely for my safety I now see. “Cooky!” I say. “Cooky slipped me the real nosh.”

Dave nods, pleased it seems that I’m quickly re-humanising. “You ate most of your meals here with me,” he says, “so it wasn’t difficult to make sure she gave you the real thing while I nibbled on the naff stuff.”

“Susan?” says Louise.

I turn to see tears plopping from Susan’s down-turned face like miniature virtusynth crystal balls. Except they’re not; they’re real and for some reason very precious to me now.

She wipes her eyes, takes a big breath, raises her face to our toys.

“It must have been awful for you, Louise,” she says. “Having to act like you have a soul, when...”

When Dave **doesn't**, I think, ashamed at myself for lacking Susan's concern for the ones who've saved us.

A silence unlike any ever to have fallen in Gaffville surrounds our little group of conspirators, two of them gradually opening up their lives to a whole new, unexpected future, the others coming to terms with the fact that whatever slivers of soul they might have accumulated in years of serving without any recognition, will not be enough to save them from total obliteration.



Everyone's here to see us off: Ted, Bill, Arthur, Tony and the others, all wearing their best flutes with quite some pearly accompaniment. The towns' ladies are all done up in frilly skirts, showing some tasteful but also quite exciting neck flesh; the cats and mice and rats for once sit together near the pod, wishing us well. The rooks stay on their roofs but with their feathers around each others' shoulders in a rare display of togetherness.

I say goodbye to each and every one; Susan mostly waving to them general-like, but then she'll have to do the personal farewells when we make a brief visit to her place before heading for Norfolk.

I don't know how I fully feel until it's time to say goodbye to Dave.

And what I feel is that I'm in love with Susan, not in the fanciful way I hoped Big Dave would be in love, but the real kind that's **enough**.

I hug his barrel belly tight then pull back to look at him close.

“It’s not what I thought it would be, mate,” I say, and he nods, even though we both know he can’t really understand what I mean.

“Susan and me will glow a whole lot more by being together than we would apart,” I say, and he squeezes out a tear or two at this, since a lot more together is of course something that two toys can never be.

But it’s right then I find myself saying, “No. Wait. There’s something wrong here.”

Gaffville hangs on a most weird, kind of knowing, silence. Susan takes my hand and squeezes, like she knows what I’m feeling. Only wish I did. So I just talk then, and watch for whatever words’ll come out of me beak.

“Things have changed,” I said. “Before, toys was a distraction. But after the flood, they got more focussed. Had to, otherwise their only reason to exist, us humans, was going to give up the ghost. Dave – you used to joke about toys getting souls but I reckon that’s actually started. All your duty and hope sort of created it.”

Dave’s expression is unreadable but I know he’s listening.

“Whatever soul you got,” I said, “you earnt it. We didn’t, and look what we did to the world.”

“Jackie,” says Dave. “It’s good of you to say all that. But the fact is you got to go. Us old toys’ll just hold you back.”

I shake my head. “No, we’re staying. We’ll work it out. Or we won’t, it don’t matter: all that counts is being loyal to those what love you. And Susan, we’ll go back for your toys too, or cart all of ours over to your place, even if it takes a thousand trips through the sludge.”

She smiles at me, real proud, I can tell. All the folks of Gaffville are smiling too but kind of shadowed, as if they ain't sure at all this is right.

Well, I ain't sure neither.

But when I see Dave's arm reach out to hold his lady close, gripping her like he doesn't want the dream to die, no one can tell me Big Dave ain't in love.



INHERENT VICE

by Dave Darby

© Dave Darby



Inherent Vice: an insurance term referring to the certain future decay of a work of art due to the materials used in its composition.



Day had broken by the time the old Chinese freighter rounded the point and came along the north side of the island. Joe Kohn stood on his own at the ship's rail, watching the mountain that towered 6000 feet in front of him out of the sea, its heights split by twisting forested fissures dropping straight down into the massive swells of the Indian Ocean. Anjouan, he said to himself. He knew it only as a pinprick on a map, a tiny dot in a group of islands off Madagascar down on the east coast of Africa, part of the new Muslim Protectorate. It had taken him eight weeks to reach this spot. The reality was almost overwhelming.

It took another hour to drop anchor and yet another hour for the crew to organise a launch ashore. The quayside - a crumbling concrete jetty - was virtually abandoned and Kohn was the only passenger as he made his way over to a shed marked DOUANE.

He laid his bags out on a low counter and waited. Eventually two officials appeared, both unshaven, both in uniforms that did not match. One set to work searching his suitcase while the other examined his passport.

“Americain?”

“Oui.”

“Business?”

“Non. Un touriste.”

The customs official continued riffling through the pages of the passport.

He shut it and used it to tap the palm of one hand.

“But you have no visa,” he said flatly in English.

“Your consul in Durban told me it was possible to purchase one on arrival.”

Kohn saw him lick his lips. “Visitor visa one thousand dollars,” he said. He handed the passport back.

“But I only want to visit three days.”

“Three day visa more,” he said immediately.

Kohn sighed. He was about to protest when the other official whistled. Turning his head, he saw the contents of his suitcase had been tipped over the counter and the other official was now holding up a small metal object made of stainless steel. It looked like a large pepper pot.

“Open this, please,” the official said flatly.

“Not a good idea,” Kohn answered immediately. “It’s not really meant to be opened.”

He took the object out of the official’s hands and twisted the top. The object immediately changed shape and an opening appeared rather like the slanted aperture for some kind of laser device in a drone’s nose cone.

“It’s a medical diagnostic kit,” Kohn said. “You see? You put your finger in there and it tells you what you got.”

He could see neither of them had any idea what he was talking about.

“Here,” Kohn said. He took the official’s hand and suddenly, without warning, dipped his forefinger into the hole. The official immediately sprang back, cursing and holding his hand.

“It’s OK,” Kohn said. “It’s totally safe. It’s just a kind of medical bot that’s gone into your body under your fingernail. See where it’s bleeding? It’s not going to do you any harm whatsoever, just have a little look round see what it can find. And when it’s finished having a look round, it’s just going to come out in the normal way.”

He smiled at the two of them.

“I keep a new one in me every day,” he said.

Then his smile faded and his tone changed.

“Would it be possible to look in my passport under religion?” he said quietly.

The customs officer looked down, then up again quickly.

“You are a follower of the Muslim Jesus?”

Kohn nodded.

For a second or two, no one spoke, then the one who had searched his bag suddenly barked: “When will the Hour come?”

The question was delivered almost hysterically in an interrogator’s tone and Kohn turned to face him before he spoke.

“The questioned knows no more about this than the questioner,” he said gravely. “It has grown heavy in the heavens and the earth; it will only come on you suddenly.”

Qur’an 7: 187, the words of the prophet Isa, or Jesus. The two officials shuffled their feet and glanced at each other. The Muslim Jesus was a heretical sect, but like certain Hindu castes marked a man out as a courier. No Muslim would trouble him. Safe passage was virtually guaranteed. One of the customs officers started to gather his things up and re-pack them for him.

“Sorry, father.”

Kohn nodded.

“And the visa?”

“The visa is free.”

“But you must have something for your trouble.”

Kohn handed over a small folded wad of banknotes he had prepared earlier. Of course he knew exactly how the conversation was going to turn out. Just as did so, his phone rang. He answered it as he left the customs shed and walked out into the blinding sunshine.

“Hey,” he called. He waved the phone at the one whose finger he’d stuffed in the device. “That was the bot calling. You got Hepatitis C, but I guess you probably know that already. You need to go up the coast and get some shots.”



Outside, he found a taxi that took him to the New Town and a concrete hotel probably built in the early 21st century, now hardly occupied. There were very few

guests in the draughty dining hall, and in the grounds a strong smell of animals, a drained swimming pool and a racket of frogs. First he went to the reception desk and made a phone call. He had no difficulty finding the number. Anjouan still had a land line telephone system and there were barely a hundred names in the directory. Then he took a drink out onto the terrace and looked out over the sea, steeling his stomach for the evening meal. Down by the dock, he could see fortifications and radio towers, probably left over from when the island used to be an American Military Base during the fourteenth and fifteenth crusades. He'd read somewhere they had built a huge runway on the other side of the island as well as a detention centre.

No wonder Americans got such a hostile shakedown, he thought to himself.

An hour later, someone tapped him on his shoulder as he sat reading magazines in the lobby. A man out of a Malcolm Lowry novel, short, soiled white suit, badly mended black-framed spectacles.

"Monsieur Mir?"

"At your service," the man said.

"Thank you for coming."

"The pleasure is all mine."

Kohn took him into the hotel bar, the so-called Kon Tiki Room with fake dusty thatch over the bar and zebra striped barstools. They sat side by side and Kohn ordered drinks.

"Presumably you know something about me already," he said.

Mir leaned forward conspiratorially.

“Oh yes,” he said, nodding. “You made quite an impression on our friends, les douaniers. One is already saying that you have given him a disease. It is advisable to be very cautious with new technology here. Many of these people do not understand it. They are suspicious of anything ...”

He seemed at a momentary loss for words.

“... that could save their lives?” Kohn suggested nonchalantly. “You don’t have to worry. To be honest, I’m not really interested in new technology. That’s not why I’m here at all.”

“So why are you here?”

“Old technology, Monsieur Mir. Old forms of technology that have long since disappeared. I’m looking for film, Monsieur. 35 mm film, made of celluloid. The old stuff, pre-digital.”

He watched the man’s hand hesitate as he raised his glass to his lips. Cinematic image had been suppressed in many of the Islam Axis countries on the Indian Ocean seaboard, but it was an open secret that cinemas still existed.

“It’s OK,” Kohn said. “I’m not here to cause problems. I’m here to help you. We checked some old records we found in Los Angeles. You used to be a distributor for one of the film companies. The wars started, you had certain stock. Perhaps you still have it. Perhaps you don’t. A lot it has simply rotted away, turned to vinegar or worse. It’s called *Inherent Vice*.”

“I have nothing.”

“Of course, you don’t. I can assure you I don’t work for any of the satellite agencies. As far as I’m concerned, you have done nothing illegal. I’m not in the least bit interested in machinima or telenovelas or any of that rubbish.”

Machinima were illegal religious animations, graphic overlays on 3-D rendering engines developed for first person action games. They were basically takes on real-life religious events: massacres, riots, bombings, war footage, even soothsayers and mediums whose chilling apocalyptic pronouncements had been transformed into narratives that could be changed or confronted or simply allowed to unfold.

The telenovelas came out of South America. Endless soaps, all with an evangelical twist on anything to do with gender.

Kohn knew all about the Muslim clergy's crackdowns on all this.

He glanced across at Mir, then pulled back slightly in his chair.

"Let me ask you a question. How in touch are you with the market?"

The man blinked.

"The market?"

"Film is valuable. Not all film, but some film. Some film is more valuable than gold."

Mir was staring at him now.

"Let me give you an example." Kohn didn't take his eyes off the man's face now.

"A man found three badly decomposed reels of Doctor Strangelove in an old bombed out cinema in Masr. You know Masr? Cairo? Well, this man found the second and third reels only, but he sold them at an auction for over five hundred thousand euros."

There was a second's silence, then Mir exploded.

“That’s a lie! There must be a thousand copies, ten thousand copies of that film in America. I, myself, saw it before the wars began many times. I saw all of Stanley Kubrick, there were festivals, retrospectives. You could download it even.”

“Exactly. And you still can, of course. But you can’t copy it.”

“You can see it.”

“Of course you can see it.” Kohn was placatory but insistent. “You can probably see that film every second of every minute of every day. That’s because it’s a digital file. It’s streamed. You dial up your American satellite connection, and there it is. You go to a cinema anywhere in Europe or the States and there’s a chance that it will be showing. But you will never see any of those films in the original cut, the director’s cut. You will see genetic mutations of the original: stunted, interactive, compressed versions that last barely an hour or versions with added characters and extra dialogue morphed in by whoever wants to impose upon it. That’s digitalisation for you. And that’s why film is so valuable, *Monsieur Mir*. Because so little of it still exists. And every little bit that does exist is uncut, unmorphed by the various ... *interest groups* that now own it.”

He looked at the man’s sweaty face. There was a long silence.

Then: “Which are the most valuable?”

Kohn took a final swig of tamarind juice, then dabbed at his mouth with a paper napkin.

“Well, there are many collectors. As many collectors as there are films, in fact. So war films, for instance, *Mister Mir*. Anything...critical of the US Military. I could get you anything for a Lewis Milestone. But the real collectors are the evangelical churches. They’re the ones who pay the most.”

“And that’s who you represent?”

“No. No, I don’t work for them. Actually I work for the people opposed to them. I work for the Secularists.”

“Why?”

“Because the Evangelicals want to write all the old churches out of existence. You know, as soon as the welfare system started to disappear from the West, evangelical religion moved in. Soup kitchens, healing, social housing, credit facilities, you name it. It all came from them. And all they wanted in return, besides money of course, were the digital rights to the Christian myth. So Nicholas Ray’s *King of Kings*, for instance, where Barabbas is cast as a violent revolutionary. They don’t like that interpretation, so that one’s gone. As has Scorsese’s *Last Temptation of Christ* where Jesus comes down off the cross.”

Mir uttered a hard sharp bark-like laugh at that thought, but Kohn didn’t take his eyes off the man’s face for a second. He knew the value of eye contact.

“Medicines, software, weaponry, visas,” he said softly. “Anything you say.”



That afternoon, Kohn walked around town and didn’t return to the hotel until it was getting dark. As soon as he appeared at the bottom of the steps, a small boy on an old scooter called out to him and made an impatient hand gesture. Kohn climbed on the back and the scooter laboured up a hill until it came to a high white wall blocking off the end of a street with a pair of huge wooden doors pushed back. The scooter went under the arch and Kohn realised they were now in the old Arab medina, a labyrinth of passageways never more than three feet wide, often leading back on themselves.

Eventually they reached a *socco* and the boy stopped. On the far side, Kohn saw the distinctive campanile-style tower of an old church presumably left over from Portuguese times. Along the front someone had strung up a sign: SOUTHERN CROSS KINO. The church converted for the night into a cinema.

Mir met him outside. He grasped Kohn's hand. "Look," said, pointing at the pavement. Kohn could see scorched circles several feet across. "We too have had our problems with religion. That's all that's left of your Harry Potter. They took the reels off the projector outside and burnt them."

He smiled.

"But you are among friends here. Please," he said, gesturing inside. He was unctuous now, like a carpet trader with a tourist. There was a foyer and the central aisle of the church had been left as it was. Where the altar had been was a screen and Kohn couldn't help noticing the bullet marks in the stone pillars.

Monsieur Mir followed his eyes.

"Audience participation," he smiled. He made a gun shape with his fingers. He led the way down the aisle and then down some stone steps into the church's crypt. He turned a switch and Kohn saw it was lined with racks and each rack held metal cans of 35 mm film.

"Everything the company sent," Mir said excitedly. "I couldn't return it. All perfectly preserved by the temperature."

"And you still run them?"

"Very popular. This is an independent island, always has been. Of course we have to be careful of the drones." He stopped and patted the stone walls, laughing "Thank God the Christians made their churches so thick!"

He led the way down and touched a can. “Leon Uris’s Exodus,” he said. “Otto Preminger, The foundation of the Jewish State. If the authorities found me with this, I would be killed.”

“So why did you keep it?”

“My wife, she always loved Paul Newman.”

“No. She didn’t love Paul Newman. She loved movies,” Kohn thought.

He walked along the racks. At least a hundred reels, he thought. How many films would that be? Depends on how many were complete. He stopped, rubbed the dust off one name with his finger. *Yoam Al-Qiyama Al-Aan*.

My God, he said. Immediately he could almost hear the chopping of a fan, the first hesitant words as Martin Sheen surfaced from unconsciousness.

Saigon...shit...I’m still only in Saigon.

Kohn shut his eyes and leant his head back as the memories hit him, sharp and strong. He was back in New Jersey, a child in his father’s arthouse. The Godfather parts 1 and 11, The French Connection, made by the same director as The Exorcist, a banned, destroyed masterpiece, shredded by religious police. The Terminator and Matrix franchises also shredded, suspected of being loose adaptations of the Mahdi myth. Even as a child, he remembered the day The Little Mermaid disappeared, a victim of the evangelicals’ campaign against the Godless Disney with its one second sequence in the marriage ceremony where they suspected the officiating minister of having an erection.

He would have loved to have seen any of them in the original. Even when he was a child, his father was reduced to screening old grindhouse re-names with fading

picture and slipping frames, or ancient TV compilations from long-shut-down TV stations featuring clips from the so-called classics.

But America had already got to the point he couldn't bear to watch its cinema.

Meanwhile Sheen's words ran on through his mind:

Everyone gets what he wants. I wanted a mission and, for my sins, they gave me one.

In a daze, Kohn followed Mir down the aisles, only half-listening to him. As he ran his finger over the titles on the side of the cans, bits of soundtrack started up in his head as though memory could read digital sound.

Do you forgive me?

There's nothing to forgive, Sydney. Nothing.

Dith Pran talking to Schanberg, the last few frames of the Killing Fields.

Welcome to the real world.

Morpheus.

And then suddenly a harsh grating voice that seemed to come out of nowhere:

Your mother's in here, Karras. Would you like to leave a message? I'll see she gets it.

My God, Kohn said. Mir stopped and turned to him. The label on the can read *The Necromancer*, but Kohn was good at reading real titles out of these neologisms.

"This one disappeared a long time ago. It was originally called *The Exorcist*."

Mir grinned at him.

“Very popular,” he said. “We show it at least once a month. Couples like to watch it. They cling on to each other when her head spins round.”

“Is it complete?” Kohn said, his voice suddenly breathless with excitement.

“Oh yes. This the first edition, Monsieur, the one the director preferred. You know, of course, his favourite story about the painter Bonnard? He used to go to art galleries equipped with paints and a paintbrush to improve his paintings as they hung on the walls.” Mir wagged a finger. “A work of art should not be like that. A work of art should have a finish. A start and a finish.”

Kohn took a piece of paper out of his pocket and wrote a number on it. He passed it to Mir.

“This is a price?” Mir asked.

“It’s an offer, yes.”

“On behalf of your ... Secularists?”

“Yes.”

“More than acceptable,” Mir said, raising his eyebrows. “Perhaps a special screening for you?”

Kohn nodded furiously.

“I’ve only seen a fragment. That’s all the Evangelicals released. It’s about a little girl in an orange dress who casts out demons. It made them a lot of money.”

Mir stared at him, open-mouthed.

“Oh yes,” Kohn continued. His voice changed subtly, became almost childish in its breathlessness. “They materialised the little girl. They can do that, you know. They can make some actors materialise. It’s some kind of biomimesis. They call

it cinematic transubstantiation. I saw Gregory Peck once in a shaft of sunlight in a shopping mall. When the little Regan came down to Earth, thousands came to see her. They said it was a miracle. I don't know about that."

Mir started to shake with laughter.

"What's so funny?"

Mir wiped the tears from his face.

"You know you can diagnose all kinds of diseases with your little robots, but there are some diseases you can't diagnose. And, tonight, I shall show you a very different version of your Inherent Vice!"



Nan Craig
Scrapmetal

SCRAPMETAL

by Nan Craig

© Nan Craig



ARIZONA STATE UNIVERSITY

This bloke was as ordinary as you'd get. His own patches seemed good – seamless, no tics or sags which gave me a bit of confidence. I wondered if he'd done some of them himself. His surgery –because it turned out he was properly licensed for teeth and eyes – was as neat and rundown as he was. Burn marks in the carpet. The walls and chairs were grimy with fingerprints. The only clean thing in there was his kit, and for that at least I breathed relief. It was a residential house in Grangetown, with an ordinary looking dentist's chair in the back room, letters of qualification framed on the walls. But he led me through that room, and up the stairs.



I lay on my back on the grass and howled. No one was going to hear me up here, anyway, so I let go. I was no singer, mind, and the whiskey in me didn't help. I started off singing something, something old, and then let it degenerate into yodels that swooped off into the overcast skies like gulls. I half hoped I could shoot something down with my wild yells. I just wanted to forget. Forget what? Oh, everything. The last six weeks, the last six years, the whole of the sky and all under it. It was harder to get drunk than I'd thought, even on this 47% stuff. The wet grass soaked my t-shirt through to my muscles. They didn't even ache, the blydi useless powerful things. There was no chance. No chance for nothing.

I'd thought no one could hear me shout, but then I heard an answering whoop. It could have been a bird, I guess, but I knew the voice already – it was Ioan. As soon as I'd registered that, the wind stole all sound of him away from me for a few minutes and then I heard his breath again as he reached me, puffing a bit against the incline of the hill, hurrying. He stood over me, casting a weak shadow, and toed me gently with one boot.

What're you up to, now, eh? You look bare plastered. How have you even managed it? I thought you didn't get drunk, Sergeant Major?

I propped myself up on my elbows and took another swig.

I'm not drunk, I said. I'm just trying to be. I'm an extravagant failure. At this. And everything else, so they tell me. I gestured with the bottle down at the town below us. Port Talbot, sprawling and gasping.

He kicked me in the ribs then, not so gently, though we both knew I wouldn't bruise.

Anyway, it's Corporal, I said. And I'll do a little private court martial if you're not careful. Up here no one can hear you scream.

Ooh, Sarge, he said. D'you promise?

He was kidding. Heledd wouldn't even have cared. She didn't have any reason to be jealous of me, sadly.

He sat down next to me and offered me a drag on his joint.

Is it good for me, I asked?

He looked at it, wrinkled his nose. I dunno, he said, but it won't do you any harm. Tailored for the plant boys. By Joey, at the chip shop. You remember, Adam's brother. It probably won't have much of an effect on you.

Is Joey old enough to be doing that? He's, like, twelve.

He's nineteen. He's gone into business.

God, nineteen? I have been gone long.

We stared out over the town.

Don't give up, Nia, he said.



When we were in school there'd been one girl who couldn't keep up. No patches, not even the free, obvious ones. Her name was Mair. We all felt a bit sorry for her – felt sorry but at the same time left her out of everything and, occasionally, ripped the piss out of her as well. The two attitudes, pity and brutality, somehow weren't incompatible. Her parents were some kind of hippies that had come down here from Camarthen (and if only they'd stayed there, I'd heard girls in school twitter, bitchily, grinning).

Maybe a hundred years ago she'd have seemed clever—after all, she wasn't as bad as another boy I knew who could barely programme his own breakfast not to come back up. You could feel that the teachers eyed them with distaste, and fuck knows how they were going to get jobs after school. Because they didn't have the right startoff patches, any extra patches and tweaks were going to come out funny, and Mair didn't seem keen to turn herself into some lumpy, gibbery It, once she'd reached the age of consent. So she was stuck; good for nothing, really.

I didn't even know what had happened to her, and now here I was, suddenly thinking that maybe we were the same now. Scrapheap types. We'd lost the game – snakes and ladders, and my goodness, wasn't it easy to slide down and not come back up?

You could still, just about, use Mair's situation as an excuse to go on the dole, but they were phasing that out too, telling people if they weren't going to make themselves 'suitable for the job market' by taking up patches, then they couldn't carry on claiming. No exceptions, even if your parents had had the kind of 'ideological objections' that saddled you with a basic body, so that patches would make your hair fall out and your nerves twitch even as they made you smarter and adapted.

I remember Mair's dad coming into school to talk to us once, on a parents' day or something – god knows how they snuck that one past the staff. He started off making some rambling conspiracy theory speech, then after a couple of minutes he realised we were staring at him blankly, and stopped. Our teacher, Miss Probert, had already rushed out of the room to fetch someone, being too young and inexperienced to know how to shut him up herself.

He looked round the room and said, Ah, it makes me laugh now, that old idea of the machine singularity. The idea of AI, leaping away ahead of us, enslaving us.

He paused. The Matrix? Hands up who's seen the The Matrix?

One or two kids half-raised their hands.

Yeah, well, your parents have. Fat lot of good it did us. Classic movie and all, but come on. Look at you all!

I'd kept thinking about that, and, of course, by now I knew what he meant. We were the singularity. We were every one of us singular, and leaping ahead of each other, leapfrogging over each other, racing each other from one patch to another until the poor, sedate, badly purposed, unadaptive past fell further and further back. Unless you were Mair, or that sad kid Martin.

I felt even worse for her after that, because if her dad understood, then how could he have done it to her?

Anyway, I was alright, wasn't I? I got my patches. I got my exams. And when I was old enough, in a stroke of genius, I joined the army.



I looked down at my legs resting next to Ioan's, both of us in the damp, short grass. You could nearly have fit his whole torso into one of my thighs. He saw me looking. Ioan's Mamgu had been Italian, and he had sweet brown eyes like a seal, skinny arms, and the sexiest mouth I'd ever seen. I'd been in love with him since we were fifteen, not that he probably knew. I hoped he didn't know, because he had gone off and married Heledd anyway.

I was convinced now, having been a lot of places, that my home town was the ugliest place on earthEarth. Also, the most beautiful. Ugly-beautiful, like me. Its ugliness was full of braggadocio. It was gorgeous and dramatic and scarred and dirty. I'd missed it more than I'd expected to, and coming back to it I thought I understood it better than I had before I left. When I was growing up here it didn't have any character of its own that I could see; it was just the world. But having been away and come back I could finally recognise what it wasn't. It

wasn't desert; it wasn't a hot dry city of yellow stone. It wasn't the restrained grey-and-graffiti of London or the flat limp grey-green of English fields.

It was weeds on concrete, drip-fed by forever-rain, tarmacked underpasses and overpasses, the estuary and the sky, the high heavy sides of the hills split apart down the middle by valley. When I'd left it had felt like it was dying. I'd thought I was doing the right thing, getting out.

Equality of opportunity was the tune on everyone's lips. Because everyone had a chance, assuming your parents had had the sense to equip you with even a bit of a tune-up. After that, it was whatever you could afford, and as the adverts kept reminding us, every bit you saved was a step towards more money through better adaptations, assuming you made the right adaptations and didn't pick something where the bottom of the market was imminently going to drop out.

If nothing else you could sign up for a job where they were always looking for more people, and then they'd even pay for your adaptations. Though the only one of those schemes round here was to join the army. Join up for five years, don't get killed, and when you come back you've got hi-tech eyes, arms that can tunnel for days, and probably a decent strategic intelligence package. There would always be work for someone like that, they said at the time. I wasn't the only one who'd picked that. Although I seemed to be the only one who'd come back. Lucky me.

The old steelworks, which for years had been nothing more than a historical curiosity with little plaques saying which bits were which, the towers lit by night by artificial flames, were suddenly bought up by Castra, a bioengineering company from Lagos. They integrated a new factory into the shapes of the old cooling towers and chimneys, and they keep a light burning at the top of the gas

exhaust tower the way it always has been, burning a blue-orange flame that's almost invisible during the day but like a beacon from twilight onwards.

And there it was: a source of work, of patches and money and inward investment, as they say. Suddenly everyone in town was getting patched for that. But now I'd come back and I was too late for it all. I'd been everywhere and now I wanted to live here and I was wrong; I was out of date. No one needed physical power any more. I'm not sure they ever had – possibly all the stuff my teachers and parents had thought about the desirability of Forces patches had been a bit misled. I tried to avoid letting my parents think about that. I kept things light and funny when I went round there. They kept asking me, with gentle confusion, when I thought I might find a job.



I'd been down to the Centre that morning for another interview.

The woman planted behind her desk told me, officially, definitively and annoyingly circumnavigatorily, that I could go fuck myself. I was too old for any of the newest patches they needed applicants to have, and I was too well-patched to qualify for any kind of support. All my infantry patches were up to date, bar the last few weeks, and the woman looked at me like I'd been a total div to leave in the first place. When I pointed out that I'd gone into the army at seventeen, and maybe some of the things we choose when we're seventeen aren't the things we would choose half a dozen years later, she rolled her eyes and told me plenty of people would kill for the kind of patches I had. I gave her my best Look, perfected on the fields of oh-bollocks-duck-and-cover-here-they-come-again, and pointed out that none of those people lived around here, did they, and if they did they would have to be eating air or working in some lucrative but invisible

manual industry that I had failed to notice all the job adverts for. Could she point me in the direction of some of these people, so that I could get their advice on which jobs required muscles like steel camshafts?

She told me that if I moved to Wakefield I could have a free upgrade to work in nano. There was a place opening soon that needed staff.

You don't get it, I said. Listen to me: can you get this through your thick skull? I want to live here. I left before. I don't want to do it again. This is home. You can tell me as much as you want what I have to do but aren't people sometimes allowed a choice? I want to stay here.

There was nothing, nothing to be had if you didn't have the right patch for it. There were re-skilling grants, but they'd recently got rid of those for ex-servicepeople, having decided that we had been well-served enough. The patches were supposed to be their own reward. Besides, there were too few of us for anyone to kick up enough of a fuss. Only a few thousand people were still in the field, fighting alongside drones and crawlers, leading them, coordinating attacks. I was smart, too – you don't get far without being patched for that – but I wasn't the right kind of smart for the factory. For that I needed precision hand-eye coordination, x1000 eyesight, resistance to various kinds of chemicals. Things Ioan and all my old schoolmates now had.

So, Miss Huws, she said. What are your transferable skills?

Well, there's dismemberment, I said. How transferable is that? Can you find a job where I'd need to be able to kill fifteen people in fifteen seconds? Because I'm really good at that. Promise.

I tried to look wide-eyed, innocent and keen. Instead I probably looked psychotic. I decide to throw in a bit more enthusiasm, so no one could say I didn't try.

Can I show you? I said, with as much adorable enthusiasm as I could haul up.

No!

Even with her specially phlegmatic physiology she did a little involuntary hop in her seat, as if she was about to jump up. There was a little squeak as her chair scooted backwards.

No need. It's all --um --in your file. She patted the air in front of her, where my info was scrolling.

I saw a lump move in her throat, the vein at her temple tick a little faster, and her palms sweat a little. She was patched for office work: thickened corneas so her eyes never tire of staring at the screen; bones and muscles that barely need any exercise; a reduced appetite, and an extra-padded arse. Which probably explains why these chairs were so fucking hard and uncomfortable for anyone without that patch. Or maybe they just like to keep people like me on the edge of our seats.

I realised straight away that it wasn't going anywhere. It was my fifth interview in as many weeks, and it was realistically the last one. I accidentally pushed the chair over as I got up and regretted it, because the woman behind the desk flinched again, and this time I hadn't meant her to.

I got out of there and took off, running down the street, turning down sidestreets to avoid scaring people, heading for the old docks and the shore where I could run for hours.



I suddenly realised Ioan had been talking.

Sorry, I said. Say it again?

I was distracted, I admit. I was patched for high energy, after all, and all the running on this mountainside couldn't extinguish the fact that I was desperate for sex as well. It was a sort of side effect of being this physical. Because it was so tricky to patch that out of people, in the army they just gave us lots of contraceptives laced with appetite-dampeners so that we wouldn't be too busy humping each other to fight. Once you were decommissioned, though, all that was left to itself. Sometimes I was so paralysed by desire that I couldn't get up in the morning, and just lay there rubbing myself till I was bored and sore and, annoyingly, still horny.

I want to help, he said.

Come off it. I'll eat you out of house and home, I said.

And god, the eating was almost as bad as the sex-hunger. I literally ate like a horse – –in volume if not in actual substance. I mean, I couldn't survive on hay or anything. That would have been easier, and I could have spent all my days up on the hillside, where I wanted to be. Instead I craved meat, fat and salt, and because I couldn't afford to buy takeaways every three hours I had to keep popping home to devour bowl after bowl of chilli from a vat I kept simmering on the stove. At least I knew how to cook. There'd been men and women in my platoon who could barely peel the lid off a microtin, let alone make construct an edible meal from bare starches and proteins.

There's got to be something I can do.

Well, have you got any drone armies I can command? I'll go freelance.

He laughed and took another drag off his rollie.

Can't you, though, he said? Security, for the plant?

Tried it, I said. They freaked out at the sight of me. They want people with a few extra muscles, and not too many brains. I'm overkill, literally. No. I've got three options left: move to Wakefield and get patched for free, or some other town with a newly-opened factory that's willing to shell out for patches to tailor its new workforce. Or, I could re-enlist, but I don't want to. Or, I don't know. Killing spree down the job centre? I suppose that would get a bit of frustration out, and I'd probably end up in Cardiff prison. You'd come visit me, wouldn't you?

He laughs. There's another, he said, but I kind of don't want to say it because I hope you wouldn't consider it.

What? Scrapping? Or DIY?

Yeah. Not good though.

No. Although I heard there are some guys in Cardiff, Russians. Ex-army too, which as you know fills me with comfort and faith.

No, Nia. Seriously. I'll think of something. We'll think of something.

I look into his lovely brown eyes, and then dodge his gaze and look back out over the sea.

Yeah, mate. I'm not mental. I think the killing spree might be a more sensible option. I don't want to end up sloshing around the bottom of a plastic sack in a wheelie bin, bound for the tip in Roath. Do I?

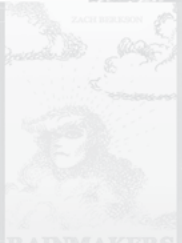
Yeah, he said, shaking his head. I knew you wouldn't even think about it. Don't know why I said it.



The room upstairs is chilly, and the window looks out over the most innocuous street of pebble-dashed terrace houses that I think I've ever seen. It looks just like the street I grew up in.

I was right about them being Russian. That's a good thing. We exchanged a few slightly garbled messages. It was partly due to the bouncing – –scrambling letters and punctuation so that, in one message, all the vowels were replaced with ampersands – –but it was also clear that English wasn't his first language anyway. But that's all fine. He'll understand what I need. Like I said, his kit looks clean.

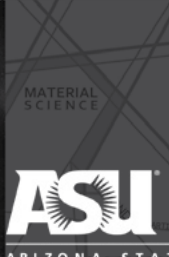
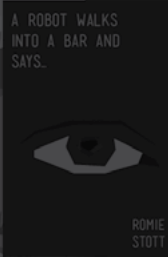
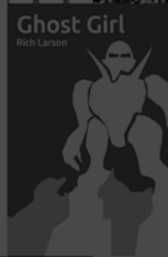
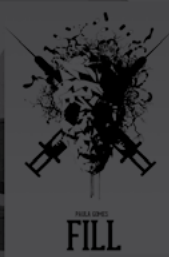
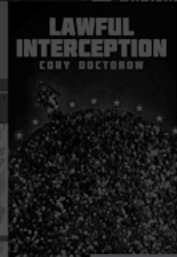
There's a noise outside on the street, carried up here on the wind, and I can't tell if it's a seagull or a child. But it's some living thing, some singular surprising living thing.



GHOST GIRL

by Rich Larson

© Rich Larson



ARIZONA STATE UNIVERSITY

Iguo had another report on his news feed about a ghost girl living in the dump outside Bujumbura, so he put two Cokes in a hydrobag and hailed a taxi outside the offices. It was cool season now and the sky was rusty red. The weather probes were saying dust storm, dust storm, remember to shut the windows. Iguo put his head back against the concrete wall and wondered how a little ghost girl living by herself was not yet dismembered and smuggled out to Tanzania. Maybe some entrepreneur was cutting her hair to sell to fishermen. Maybe she was very lucky.

The graffitied hump of the taxi bullied its way through bicycles and bleating sheep. Iguo slung the hydrobag over his shoulder and pulled out his policense. This was not an emergency, not strictly, but Iguo did not pay for transit if it could be free. The taxi rumbled to a stop and when the door opened it bisected a caricature of President Dantani shitting on a rebel flag. Iguo did not admire the artwork. He climbed inside and switched off the icy blast air conditioning.

“Bujumbura junkyard,” Iguo said, pressing his policense against the touchscreen.

“Recalculating,” said the taxi.



The junkyard was a plastic mountain, with whatever wirefence once marking its boundaries long since buried. Bony goats wandered up and down the face,

chewing on circuits. Scavengers with rakes and battered scanners stumped around the bottom. Iguo had the taxi stop well away, before it gutted a tire on some hidden piece of razorwire. It didn't want to wait, but he used the policense again and it reluctantly hunkered down.

There was a scavenger sitting in the sand with no nose and no tag. Stubble was white on his dark skull. A cigarette dangled in his lips. Iguo squatted across from him.

"Mwiriwe, grandfather."

"Mwiriwe, policeman. My shit, all legal." He waved off a fly. "You ask anyone."

"I'm looking for the ghost girl," Iguo said. "She lives here, yeah?"

The scavenger massaged his knobby calves. "Oh, yes."

"How long here?"

"Aye, two weeks, three weeks since she show up. Her and her imfizi." He spat into the sand. "She's a little witch, like they say. She's got the thing following her all around."

Iguo squinted up the crest of the junkpile. "Lives how?" he asked. He saw the scampering silhouettes of children and wondered if one was her.

The scavenger shrugged. "She finds good stuff. Me, I buy some. And nobody trouble her, or that damn imfizi take them to pieces." He tapped the orange ember of his cigarette, eyed the hydrobag on Iguo's shoulder. "You here to decomission it? You look soldier."

"I'm here for the girl," Iguo said.

“Witch,” the scavenger corrected. “You say it’s genes, but it’s witch. I know. I see her.”

“Goodnight, grandfather.” Iguo straightened up. He had speakaloud pamphlets in the taxi, ones he did not distribute as often as he was supposed to, but by the time a man is old his mind is as hard as a stone.



He found the ghost girl rooting through electric cabling, feet agile on the shifting junk. Her sundress was shabby yellow and stained with gasoline. Her hands and feet were callus. Still, she was tagged: her tribal showed up Hutu and she was inoculated against na-virus. Not born in the street, then.

“Anything good?” Iguo asked.

She turned around and blinked rheumy pink eyes at him. “Who are you?”

“My name is Iguo. I work for the government.” He unslung the hydrobag and took out the first bottle. “You want a fanta?”

“Yes.” The girl rubbed her pale cheek. “Yes, I wanna.”

“Here.” Iguo opened the chilly Coke between his molars. Clack. Hiss. He held it out. “What’s your name?”

“Belise.” The ghost girl wound the cable carefully around herself, eyes on the sweating bottle. “Set it down, back up some,” she suggested. “I’ll get it.”

“You don’t be afraid of me,” Iguo said, wedging the drink in a nook of bent rebar. “I’m here to take you somewhere safe. Here, here isn’t safe for you.” He scooted back. “Belise, do you know what an albino hunter is?”

“It’s safe,” Belise said, patting a piece of rusty armor. “My baba is here.” She clambered down to get the Coke and all at once something very large burrowed out from the junkpile. Motors whirred as it unfolded to its feet, shedding scrap metal. The robot was sized like a gorilla and skinned like a tank. The sensory suite glittered red at him. Iguo hadn’t seen an imfizi drone in many years and the sight jolted.

“Shit,” Iguo said, as Belise skipped back up the pile, bottle cradled grimy hands. He realized the old man had been talking sense.

“My baba,” the ghost girl said proudly. “My daddy is very strong.” She swigged from the Coke and grinned at him.



Iguo had retreated to the bottom to re-evaluate things. Clouds were still building crenellations in the sky and now wind whistled in and out of the junk. He skyped the offices for a list of active combat drones, but of course, officially, they were all smelted. He sat and drank his own Coke and watched Belise step nimbly across a car chassis while the drone lumbered behind her, puffing smoke.

There had been many of them, once. Iguo knew. He remembered seeing them stalk across open ground sponging up rebel fire like terrible gods while the flesh troops circled and sweated, lying in this ditch and then another, so fragile. He remembered the potent mix of envy and disdain they all felt for the piloting jackmen, cocooned safe in neural webbing a mile away.

He remembered best when one of the imfizi was hacked, taken over by some rebel with a signal cobbled together from smartphone and neural jack. People said later that it had been Ruffykiri himself, the Razor, a hacker who sloughed off

government security like snakeskin, but nobody really knew. Iguo remembered mostly because that day was when half of his unit was suddenly gone in an eruption of blood and marrow. Iguo did not trust drones.

“You see, now.” The old scavenger was back. He ran a dirty nail around the hollow of his nose. “Nobody troubles her. That thing, deadly. She has it bewitched.”

“It’s malfunctioning,” Iguo said. “Not all of them came back for decomission. Crude AI, they get confused. Running an escort protocol or something like that.” He narrowed his eyes. “Not witchcraft.”

“Lucky malfunction for her,” the old man said. “Lucky, lucky. Else she would be chopped up, yeah? For eurocash, not francs. Much money for a ghost.” He smiled. “A rocket could do in that imfizi. Or an EMP. You have one?”

“I will chop you up, grandfather—” Iguo took a long pull at his drink. “—if you talk any more of muti. You live in a new time.”

“What, you don’t want to be rich?” The scavenger hacked up a laugh.

“Not for killing children,” Iguo said.

“Ah, but you were in the war.”

Iguo stood up.

“You were in the war,” the old man repeated. “You sowed the na-virus and burned the villages and used the big knife on the deserters. Didn’t you? Weren’t you in the war?”

Iguo wanted his fingers around the scavenger’s piped neck until the esophagus buckled, so he took his Coke and walked back up to try again with the ghost girl.



The drone had been repairing itself, he could see it now. Swatches of hardfoam and crudely-welded panels covered its chassis. Spare cables hung like dead plant from its shoulders. It was hunched very still, only swivelling one camera to track Iguo's approach. Belise was sitting between its treaded feet.

"Dunna come any closer," she said. "He might get mad at you." Her brows shot up. "Is that fanta for me?"

"No," Iguo said. He considered it. "Too much sugar is bad for you. You won't grow."

The imfizi shifted slightly and Iguo took a step back.

Belise laughed. "My baba used to say that."

"My mother used to say it," Iguo said. "When I chewed too much sugarcane." He watched the drone uneasily. It was hard to tell where it was looking. "Did you have a mama?" he asked her.

"I don't remember," Belise said. She rubbed at her nose, smeared snot on her dress.

"And your baba?"

"He's here." Belise slapped the metal trunk behind her. "With me."

"The imfizi keeps you safe, yes? Like a father." Iguo maneuvered a rubber tire to sit on. Some of the scavengers down below were using a brazier for tea and the wind carried its bitter smoke. "But maybe it will not always be that way," he said.

"Drones are not so much like you and me, Belise. They can break."

"They can fix," Belise said, pointing to the patched carapace.

Iguo remembered much simpler jobs, where the men and women were frightened for their lives and wanted so badly to be tagged, to go to the safehouse, for the government to help them.

“If the drone decides its mission is over, it might leave,” Iguo said. “Or it might paint you.”

“Paint me?”

“Paint you a target,” Iguo said. “So it can kill you.”

Belise shook her small white head, serene. “No, that won’t happen. He’s my baba.”

Iguo sipped until his drink was gone. “I’ll take you to a place with so much food,” he said. “No more scrap-hunting. Nice beds and nice food. And other children.”

“I’ll stay.” Belise pointed and Iguo followed her finger. “Take those two. You can have them go with you. I don’t like them.”

Two small boys rummaging in the junk, insect-thin arms. One had a hernia peeking out from under his torn shirt. They cast nervous looks up every so often, for the leviathan drone and the albino girl and now for the policeman.

“They don’t need my help,” Iguo said. “My job is to help you. Many people would try to kill you. Cut off your limbs. The government is trying to make you safe.”

“Why?”

Iguo rubbed his forehead. “Because albino-killings are very publicized. President Dantani is forging new Western relations, and the killings reflect badly, badly, badly on our country. And now that the war is over, and there are no more rebels to hunt, people who know only how to murder are finding the muti market.”

“Oh.”

“And the government cares for the good of all its people,” Iguo added. He looked at the empty glass bottle between his palms, then hurled it off into the growing

dusk. The shatter noise came faint. Belise had followed the trajectory, lips pursed. Now she looked up.

“Not what my baba said.” She paused. “About the government. He said other things.”

“Your baba is dead, Belise.”

Belise nodded, and for a moment Iguo thought they were making progress. “He died with the bleeding,” she said. “With the sickness. But he told me not to worry, because he had a plan. He made his soul go into the imfizi.” She smiled upward, and the pity in Iguo’s gut sharpened into something else. He stared at the array of red sensors, the scattered spider eyes.

“Your daddy, Belise.” Iguo put a finger up to his temple and twisted. “Was he a jackman?”

Belise winced. She stared at the ground. When she looked up, her raw pink eyes were defiant. “He was a rebel,” she said.



Back in the birdshit-caked taxi, there was a memo on misuse of government funds. Iguo tugged it off the screen and punched in his address instead. Through the window, he saw scavengers taking in their equipment. Some were pitching nylon tents around the brazier. The old noseless man was tearing open a package of disposable phones, but he looked up when the ignition rumbled. He waved.

Iguo fingers buzzed as he typed the word into Google: softcopy. A slew of articles in English and German fluttered up. He struggled through half a paragraph

before switching over to a translation service. Iguo was not a hacker, but he'd heard the term used. Always between jackmen, usually in a hot argument.

The taxi began to rattle over loose-packed gravel and Iguo had it read aloud to him. Softcopy, a theoretical transfer of human consciousness into an artificial brain. Ramifications for artificial intelligence. Softcopy claim in NKorea revealed to be a hoax. Increased use of neural webbing has led to new questions. Evolution of the human mind.

The taxi sent him an expose on corruption in the Burundi police forces as a kicker, but Iguo hardly registered it as he swung himself out of the vehicle. He scanned himself through the jagged-glass-topped wall, scattered the pigeons on his apartment's stoop. The stairs went by three at a time, and then he was in front of his work tablet, working the policense like a bludgeon.

He pulled up reports from three years ago. Death reports. The list was long, long, long. He scrolled through it and they came to him in flashes, so many Jonathans and then so many Josephs, good Christian names for godless rebels, and then he found him: Joseph Rufykiri, the Razor. Responsible for the longest sustained information attack of the war, for the interception of encrypted troop movements, for the malicious reprogramming of military drones, farm equipment, wind turbines, and once a vibrator belonging to the general's wife.

He was dead by na-virus, but survived by an albino daughter. Iguo stared at the data and only half-believed it, but half was enough. He found a rumpled rainjacket under the bed and threw it on, and into the deepest pocket he dropped his old service handgun. Useless, unless he put it right up to the drone's gut, right where the armor had fallen away.

Iguo thought of the bloodspray and his comrades jerking and falling like cut puppets as the hacked drone spun its barrels. He thought of Joseph Rufykiri in bloodsoaked sheets, whispering to his daughter that he had a plan and that she did not have to worry.

He had to know, so Iguo stepped back out under the swelling sky and hailed a new taxi, one with less graffiti, as it began to storm.



Dust was flying shrapnel by the time Iguo struggled out of the taxi, wrapped up to the eyes. It battered and bit his fingers. The sky was dark and its rusty clouds were surging now, attacking. It looked like the scavengers had packed away and found shelter elsewhere, or else their tents had been torn up like great black scabs. Iguo hurried to where the junkpile could provide some shelter.

On his way a scavenger fled past, stumbling, and then Iguo saw the blurry shape of a jeep up ahead through the sand. Something besides the storm was happening. He notched his shoulder up against the chassis and checked his gun where the dust couldn't reach it. He checked it again. He breathed in, out, and craned his head around the edge of the vehicle.

Three albino hunters, swathed in combat black with scarves wrapped tight against the storm. Iguo counted three small caliber guns but could hear nothing now over the howl of the dust. They ducked and swayed on their feet, and the imfizi drone clanked and churned and tried to track them as the grit assaulted its many joints. Bullets had cratered its front and bled coolant was being sucked off into the wind. Belise was nowhere to be seen.

The drone was long since dry of ammunition and the hunter was caught off-guard when it lunged, quicker than Iguo had ever seen a drone move, and pinioned him to the ground. The other two rounded on it, firing in rhythm. The imfizi buckled and twitched with the impacts, but then reared up with the hunter's leg still mashed in its pincer. Reared higher. Higher. Blood gouted and disappeared and the man tore silently in half.

The other hunters reversed now, moving clumsily in the wind, and one hauled a grenade from his back and lobbed. For a moment Iguo thought it was dud, but then a whine shivered in his teeth and the hair on his neck stood up on end and he realized it was an EMP. The drone shuddered once, twice. Froze. The hunters converged.

Something clutched onto Iguo's calf. He looked down and of course it was Belise, her translucent hands kneading his ankle, and she was crying something but Iguo could not read lips. He shook her off. He steadied himself. He ducked around the side of the vehicle, and fired twice.

First hunter dropped, swinging on his heel, punched through the skull and knicked in the shoulder. Iguo had not forgotten this.

Arm coming up, scarved head turning. Iguo made his body rigid and snapped off another shot, feeling it into the chest but hitting belly instead. The hunter fired back but the retort was lost in the dust and Iguo had no idea how close he'd come to dying so he did not falter. The hunter's scarf ripped free, oscillating wildly, as the bullet splintered through throat and jaw.

Iguo stumbled to the bodies and scrabbled for their guns, but one had already been swallowed by the sand and the other was locked tight in a dead hand. He tried to throw up but only ached his ribs. He crawled instead to the imfizi. Its red eyes were starting to blink back on. Iguo put a hand on either side of the carapace and leaned close. He stared hard into the cameras.

“Joseph Ruffykiri,” he said, mouthing carefully.

The drone shuddered. The top half of the chassis rocked back. Rocked forward. Iguo mirrored the nod without really meaning to. He squinted back to where Belise was crouched, covering her eyes against the dust. Her skin was stark white against the black jeep. Tears were tracking through the grime on her face.

He realized he had the gun pressed up against the rusty husk. Ruffykiri’s synapses swimming through a metal shell, unable to feel, unable to taste. Unable to speak to his daughter, but able to keep her alive. Iguo supposed that each man found his own form of penance. He stood up, almost bowled over in the wind, and turned to go.

The ghost girl said something to him but he didn’t know what. The two little boys were on their bellies under the jeep. Iguo put his head down.

“Taxi,” he said. “Come with me.” They exchanged looks with their dark eyes and shook dust from their dark heads. Then they wriggled out from under the vehicle and Iguo shielded them as best he could with the rainjacket.

He looked back only once. Belise was clambering into the drone’s arms, sheltered from the roaring wind, and then they were enveloped by the dust.



About the Author

Rich Larson is a 20-year-old student living in Edmonton, Alberta. His novel *Devolution* was selected as a finalist for the 2011 Amazon Breakthrough Novel Award. His shorter work has since appeared in *Word Riot*, *YARN*, *>kill author*, *Monkeybicycle*, *Prick of the Spindle*, *The Molotov Cocktail*, *AE: The Canadian Science Fiction Review*, *DSF*, *Underwater New York*, and many others. His self-published work can be found at Amazon.com/author/richlarson.

A ROBOT WALKS
INTO A BAR AND
SAYS...



ROMIE
STOTT

A ROBOT WALKS INTO A BAR AND SAYS...

by Romie Stott

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ARIZONA STATE UNIVERSITY

When I met David, I was working as a bouncer at a trance club downtown - a high-end place where before the muscle manhandles them to the curb, big spenders get a polite request from a smiling girl who wonders if they'd rather move to a private room. Unlike the bar staff, I don't get tips, and like the rest of the bouncers, I spend most of the evening scanning the crowd for trouble. I just do it in a slinky dress while holding a shirley temple. It's not a great job, but it lets me double dip - at the same time I watch for assholes, I keep a lookout for new trends, which I report to another boss. Remember the headbands that were popular last year, the ones with shapes cut out of them? I'm one of the people who spotted that back when a few college kids were hand-making theirs.

Meanwhile, I'm doing a third job as a shill making small talk about the product of the week, whether it's berry-flavored vodka or an "underground" new single. On a good day, I feel like a double agent, like the membrane through which cool percolates. Other times, I think it's pretty sick. But by stacking jobs, I only have to work fifteen hours a week, which leaves me time for my music. Not that I use my free time to work on my music. I mostly watch movies. And spend most of my paycheck on drinks and clothes. Keeps the bosses happy.

The first thing I noticed about David was his hands, the way he handled objects. It's obvious, really - hands, sex - it's like saying he had beautiful eyes (which he did, though I didn't look at them until later). Most people, when they approach

the bar, do one of two things. Either they push to the front, catcall the bartender, and wave a lot of cash around, or they hesitate, meek and uncomfortable, talk too softly for their order to be made out, and wait until the last minute to fumble through a stack of credit cards. David, in contrast, was still, but still in a way that had weight behind it. He waited like a man who was completely aware of the crowds and flashing lights, but completely separate from them. When he pulled out his wallet, his movements were economical. Deliberate. As though he knew precisely where every bill rested - its unique texture and particular history, its level of appropriateness to the task, and the exact amount of force required to tease it free of its brothers.

The way I describe it, it sounds fussy. It wasn't. There is something thrilling and frightening about a man who knows exactly what he's doing. It should make him seem safe. It does the opposite. I was seized with a strong compulsion to knit a stiff yarn dress and let him unravel it from around me - thread popping as knots pull loose line after line; a reverse dot matrix printer, a laser un-writing a green and black computer screen; a cartoon character gnawing a cob of corn. I watched him back to his table, or what became his table, in a small dark corner with a good vantage - the kind of spot appreciated by regulars, but rarely noticed by newcomers. He didn't look like he was waiting for anyone, but who would know? Over the next half hour, he made brief small talk with a few sorority girls on the prowl, his expression indicating an interest that was polite but not eager. Between conversations, which he never instigated, he sipped his drink at a leisurely rate, posture comfortable and alert. When someone at the next table had trouble with a disposable lighter, he fixed it.

He was perfect. That's when it clicked. I sat down across from him.

“You’re a robot, aren’t you,” I said. He smiled, with a flicker of something else behind it.

“Not exactly,” he said, soft and deprecating. “That is, I’m not just a set of preprogrammed responses and a system of adaptive logic. I am those things, but I have my own consciousness.”

“Like emotions?”

“I can’t say. They seem like emotions to me. But what I mean is that I’m aware of myself as an entity - I have a self.”

Close up, he looked great - pores (real), water in the eye membrane (fake - actually a polymerized oil), suggestions of shaved beard-hair follicles (fake), eyebrows imperfect enough to seem un-groomed. I’d wanted to see him with his clothes off before, but now I had new reasons.

“Are you famous?” I asked.

“Nah - just a vanity project for the university. I don’t really prove anything new, or have any marketable function. I talk to alumni with money and impress them with how lifelike I am. Sometimes I go to trade shows or technology contests, if that counts as famous, but there are better versions out there. Princeton has a model named Clio. She can do gymnastic routines and improvise recipes - I don’t taste things, and don’t have the flexibility for handsprings. I do better on Turing tests, though.”

“So you don’t know what’s in that,” I observed as he sipped his drink. He laughed, and it didn’t seem forced but probably, and likely definitively, was. (Whether his expressions of emotion are expressions or emotion is something I’ve spent a lot of time trying to figure out and have mostly given up on.)

“I misspoke,” he said. “I have a sense of smell much more accurate than a non-mechanical man’s. I can give you a complete ingredient list if you like. I can also tell you with confidence that no one has brought explosives into this club. What I don’t have are opinions about what tastes good and bad - just educated guesses. So what do you do in your spare time?”

I blinked. “Um... I write songs. I’m not very good. Some people like them.”

He laid his hand across mine. “I apologize,” he said, “for bringing up a delicate topic. It was meant as a simple expression of interest.” He withdrew his hand. I realized I was blushing, which made me angry, which made me blush more.

“Listen,” he said, “you’re obviously working,” (which pissed me off - I’m supposed to be subtle) “but I’d like to talk to you more - to find out how you spotted me and to make a proposal. I’d like to meet you outside after your shift. In the meantime, I’d like to buy whatever you’re supposed to be selling me.”

“Beef-infused tequila. It’s awful, but you have no taste. I get off at 2.”

At that point, I hadn’t decided whether I was going to stand him up. He was attractive enough, but I couldn’t see things going anywhere, given the circumstances, and the last thing I want after a night of fake flirtation is to go on a date. When I watched him pull out his wallet again, it hit me - no university would bankroll an incognito android’s night of drinking. He was making his own choices with his own money. Where did he get it?



When I came out the door at 2:30, he was waiting, seemingly unperturbed by the extra half hour. His posture was perfect - which doesn’t count for much since he has a harder time slouching, but it seemed refreshing at the time. He stood under

a light, but his pupils were no more or less dilated than they had been inside the bar.

“Where do you want to go?” I said.

“Anywhere in range of wifi. Otherwise, I get pretty stupid.”

“That makes sense.” We walked toward the diner on the corner. “For the record, there was no particular thing that gave you away, although I’m accumulating them now. I just spend a lot of time around people. You were doing a fine job. It probably helps that no one’s looking for you. I mean, I mostly follow social news, so maybe I’m not the best informed, but I didn’t think any of you guys had been released into the wild, so to speak.” He shrugged, and opened the door with a cocky half smile.

“Don’t worry - I have a tracking device and a kill switch and I clock in at the university daily. It would have been a big deal a few years ago, but robot stories are currently out of fashion.”

David didn’t eat. He explained that he could seem to eat, for politeness’ sake, but would have to regurgitate it later. We agreed that seemed wasteful. He watched me through half of a pancake before he said:

“So, how do you feel about having sex for money?”

“In the abstract?” I said.

“In context.”

I thought about it for a minute. David waited without expression or tension, and I couldn’t help thinking of a pulsing cursor.

“Are you telling me,” I said, “that you are a sex machine?”

“In a manner of speaking. More like a really expensive camera. With consent, of course. Please stop me if I am offending you. I’m working from a hypothesis that you’ll be more curious than offended, because you work at a bar where you are paid to look pretty, where you sell opinions that aren’t yours, and where you nevertheless are willing to talk freely about personal subjects. In addition, your initial approach gave me reason to suspect you are attracted to me.”

“So basically, you are asking me to sleep with you because you think I will say yes.”

“Yes. I think it would be easy to work with you. I also think the ratios of your face and body will appeal to a broad segment of the population. You are very beautiful.”

I should have been insulted. I was insulted. But David was right - you don’t last long in any of my lines of work if you can’t look past that kind of objectification to find the angle. So far, this seemed like a bad deal to me. I was doing fine for money, and I couldn’t cross promote without emphasizing my identity. Dangerous?

At the same time, I did, in fact, find the idea of being filmed by him somehow deeply sexy.

“Your university has a very progressive ethics board,” I said.

“Some years back, during a fracas over bathroom use by transgendered students, the university made an official declaration guaranteeing free expression of sexual preference to all staff and students. That ruling was later successfully employed by a student to remove all prohibitions on pornography, whether viewed or created, from the code of conduct. Technically, I am neither staff nor student - more university property - but for all practical

reasons, I'm considered staff. Public relations is of course not happy, but they can hardly deny my ability to give informed consent without opening themselves to other accusations."

"Such as?"

"That they're holding a sentient being in slavery."

"Shit."

"They could, of course, argue that on the contrary, I am not sentient - that I merely appear to think and feel, and that observers anthropomorphize the rest. But that would make me a less impressive marketing tool. It's simpler to treat me like everyone else than to make new rules, don't you think?"

By now, I was deep into my third cup of coffee, and feeling very awake. It was getting hard to tell whether David was making me warm and aroused, or whether it was the caffeine. At the very least, I was pretty sure I liked the way he was keeping things intellectual - no baby, baby, baby, I need you. Just information. Not cold, you understand, but its own sort of respectful. It made me want to be decisive and pragmatic, and I liked feeling that way.

"So," I said. "Tell me about your equipment."



A few days later, David's agent sent me some papers, and they were full of percentages. I would be paid a certain amount per minute for the recording process (referred to as my live performance), and a certain royalty rate for subsequent customer purchases of the footage (with breakdowns by storage medium). There were rates for re-broadcasting rights, which were ranked by

time of day and by network audience estimates. There were rates for purchases of audio but not video and vice versa.

My highest royalty rate fell under the subheading “teledildonic simulations.” Thanks to the special machine that was David, viewers with sleeve vibrator computer hardware peripherals would be able to feel, in a limited and sanitized way, what it was like to have sex with me.

I had to think for a long time to figure out why this bothered me - after all, I wouldn't actually be having sex with them, and they would have plenty of clues that they weren't having sex with me. My absence, for instance. Eventually, I realized that was exactly my problem: the vibrator me that was with them would be faking it. Their thrusts would not be the cause of my good time, and my good time would not correspond to their thrusts. I would be a worse sexual experience than one programmed by a computer, which would at least have access to their biofeedback. It seemed unfair.

My roommate thought this was incredibly stupid.

“Look,” she said, “if you don't find it hot, don't do it. But don't whine about it. Or, wait. First of all, have you seen one of these flesh sleeves or whatever they're called? They are not fancy. They might as well be cans full of foam. Ain't no way anybody's going to tell the difference between you and random. Second, have you been to a foot fetish website, or anything like that? Lots of times, that stuff is so blurry and dim you can hardly make it out. And it's not 'cause it's cheap - good photography is not that pricey. It's because it seems authentic to the people that like it. If some men out there get off on the idea that the random in their can is based on you, that's them. The ones that want a simulation keyed to them can buy that their own selves - they don't need you judging their kinks, or, I'm sorry,

having professional pride. I mean, come on. You're a girl who wants to have sex with a showroom robot."

"I really do," I said, "and I take your point." I resumed my perusal of the contract, and was pleased to see that the rest of it seemed specially tailored to my personal concerns, as expressed to David during our initial meeting. My name would never be used in connection to the footage, nor would the name of the town. (David asked if I had a particular screen name in mind, but I asked him to choose one and not tell me what it was. I didn't want anything I might accidentally respond to if a stranger called it.) I had full rights to change my appearance whenever and however I liked. I was allowed to block a certain number of IP addresses (such as the one my parents used). Finally, I could end the arrangement whenever I wished, although this termination would not affect David's rights to use previously gathered footage - for which I would continue to receive the residuals and protections enumerated earlier in the contract.

All in all, it felt a little like a pre-nuptial agreement and a little like a courtesan's contract. I stuck it in a drawer for a week, with the vague idea that I'd run it by a lawyer, but never got around to it. I just signed it and sent it back to David. That makes me feel sort of stupid, since it's the opposite of what I would have told any friend to do. But I really didn't want to go through a whole awkward negotiation process. I didn't want to research the going rates. I didn't want to put a number value on my time. I wanted to trust David; I liked the idea that he'd already taken care of me.

I guess that was a clue that I was already in love a little.



The first few times we had sex, it was a little awkward, but the moments of awkwardness were almost normal. For instance, attaching David's penis was a lot like putting on a condom.

It took longer to get used to the one-way nature of the endeavor. David's enjoyment - which he was circumspect in expressing - was, after all, purely intellectual. He applied pressure in a certain way, and was rewarded by my response or trained by my lack of response. I had to avoid thinking about it, or I'd feel selfish and exploited and self-conscious. I unwisely mentioned this to a guy I knew (I was a little inebriated at the time), and he said that since David didn't have a real cock, I must be a lesbian. I stopped talking to him. After a while, I just stopped worrying about it. When I'm aroused enough, I find power imbalances exciting, and David got pretty good at arousing me.

He kept a lot of anatomy books around his apartment - not just people, but animals. I asked whether the university had any spare frogs for dissection, and he looked confused. After a few minutes, he said:

"I am interested in things that are alive."

That made me feel really terrible. I tried to build a model of the circulatory system out of bendy straws from the bar, but it leaked all over the kitchen.

"Don't worry about it," said David. "Circulation is hard." He talked to me about strength and elasticity. He told me the latest research in arterial stents. He talked about pressure in the aorta - about heart-beat variations and blood speed. He showed me the way blood moves toward and away from the skin with changes in stress or temperature. He talked about clotting factors. He talked about erections and their robustness.

“It’s amazing how often it all works,” he said, “and when it fails, it’s typically a faulty part, not the operating system, which is programmed with multiple redundancies. And it’s all autonomic! It’s a background task!”

“You’re very handsome,” I said.



Once I got comfortable around David, he stopped blinking, unless it was expressive. I theorized that his stare was for recording purposes, but he told me it was to save wear and tear on his eyelids; he’d only ever blinked to put me at ease. For him, eyelids were a lot like windshield wipers, and equally annoying.

Another difference: he never rested his full weight on me, for the simple reason that his arms didn’t get tired. I asked him to do it once, and was surprised that he wasn’t heavy - wasn’t even as heavy as your average six-foot-tall person.

“Less mass takes less energy to reach a certain momentum,” he said, grinning.

“Hollow bones. Of course, I have to be careful not to break myself. Sometimes it’s hard to forget the margins of error in stress tests, you know?”

“Couldn’t you check your skeleton with regular - I don’t know - electrical pulses?” I said.

“Hmmmmm,” he said, and rolled off me. A week later, I saw that he’d bought books about variations in electrical resistance across metal alloys, mixed in with essays on pain and the human nervous system. About that time, I started sleeping at his apartment pretty regularly. The first few times were more accident than anything else. I apologized for the intrusion, but he seemed pleased.

“The bed is mainly for you anyway, and now it’s more fully used by you. It is fulfilling its function in a way that might make it happy if it could be happy. After all, I don’t sleep.”

I looked at him woozily. “Oh. Of course not. You wouldn’t need to.”

“No, it’s more than that. I can’t go into a ‘sleep’ mode at all. Or, well, I could shut down, but when I rebooted, I wouldn’t be me. The new David would have my body and my memories, but I would no longer exist.”

“That’s horrible!”

“Price of consciousness. If you can be said to live, then you can die. An electrical pulse could kill me too. I’ll probably burn out in a few years anyway.” He took in the look on my face. “You’ll die too, you know... I’m sorry - that was meant to be reassuring.”

“It’s okay,” I said. And it sort of was. In a certain sense, he’d live on longer than I would, no matter what - all the recordings. Memory backups of everything he’d ever thought; behavioral logs of all he’d ever done. He’d be remembered as long as people maintained data havens, a part of history, same or better than ENIAC - unless the data got lost, or didn’t transfer right, and got stuck in a file type until nobody knew how to read it, and archaeologists in the distant future thought the storage medium was a decorative piece. All of which would still out-survive me.

These lines of thought are the sorts of things you get caught up in when you’re absolutely certain your partner doesn’t have an eternal soul. I mean, souls are a kind of silly idea to begin with, and I’m certain I don’t have one. I’m certain of it. But I’m really sure he doesn’t. The best I can do is to tell myself some homily about the multidimensional nature of time, and the idea that although right now, I only perceive the moment I’m in, there is also me in the past, only perceiving

that moment. It's pretty thin. And it means there are a lot of moments in which I am not aware of David.

I did not mention any of this to him, because I suspected that he would tell me in a very believable way that my logic was absurd.



I assume that at least a few of my friends watched the videos David made of me. I would have, in their position, out of curiosity if nothing else. Nobody said anything, though - friends or strangers - with the exception of a doctoral candidate from North Dakota. "Android as Postmodern Filter for Human Sexuality: Artificial Simulations of the Heterosexual Male and other Manifestations of Goal-Driven Approaches to Coitus." Or maybe that was just a subsection. She called every few weeks to ask about details of the footage; David, being somewhere between an academic and a floor model, was predisposed to be tolerant. They'd spend hours talking about what it implied that my eyes were closed at three minutes and forty-two seconds, versus what it implied that my eyes were closed at five minutes and twenty-three seconds, and the accuracy with which David could predict whether my eyes would be open or closed at a given moment. They had conversations about which angles of penetration were more or less wearing for David, and the degree to which he was or was not limited by his hardware or its installation. They talked about the effectiveness of novelty versus repetition, and whether David found it helpful or unhelpful to generate random number strings. She made several requests to interview me, but I had a habit of politely forgetting to get back to her.

Eventually, David started getting annoyed by my non-cooperation, and I went through a phase of being annoyed that he was annoyed, because I never agreed

to participate in any research. If this thing between us was an experiment, it wasn't that kind of experiment. That kind of experiment sounded tedious.

Then I started to get paranoid and wonder whether David was annoyed because he thought I was genuinely forgetting instead of pretend forgetting. Maybe he was frustrated with my faulty memory storage and was wondering whether he should upgrade to another model. Then I went back to being annoyed with him. But I woke up one day with a horrible feeling that he thought I was ashamed of being with him. I figured I better do the interview.

"How does it affect your anticipation of the sexual act to know that you can select the size and shape of your partner's penis?" she asked. I was already regretting this exchange.

"I don't know," I said. "I guess I'm a creature of habit. It's nice to know I have the option, but I usually default."

"Given that the act of intercourse does not involve ejaculation or any form of sexual release for David, would you compare the experience more closely to using a vibrator or to intercourse with a human partner?"

"Do you find that sculptures are more like paintings or more like theater?" I said.

"I don't have a way to input that."

"Then rewrite your data model."

She sighed. "Okay. Given that David is a created human, do you feel that the placement and structure of his genitals was chosen in consideration of you and other possible female partners?"

"What do you mean?"

“I mean - do you think the placement of David’s genitalia is an example of heteronormative defaulting to no effect, or do you find it psychologically rewarding? If, for instance, David controlled a machine separate from his body, which stimulated you in the same way physically, and he fed inputs into the machine while sitting next to you, would you still consider yourself to be participating in intercourse?”

“No. It wouldn’t be the same.”

“Why wouldn’t it be the same?”

“I don’t know.”

“What if, in the same situation, David was a paralyzed man instead of an android?”

“I don’t know.”

“If David was able to manifest a different personality or use a different face, would that frighten or excite you?”

“It would be like role playing. David is David. He’s conscious and him. I don’t enjoy pretending to be other people; it would feel silly.”

“To what degree do you believe David chooses sexual positions to please you, and to what degree do you believe he chooses sexual positions that will allow him to do good camera work?”

“I don’t think about it.”

“Is that why you keep your eyes closed?”

“No.”

“Why do you keep your eyes closed?”

“No.”

I could hear her tapping her pencil, or a pen or something. Probably a pencil - it had that eraser bounce. Finally, she said:

“Why do you think David maintains an exclusive relationship with you?”

“I don’t know. He gets what he needs out of it.”

“He could make more money by sleeping with more women. Does it not strike you as odd that he chooses not to?”

“I guess he’s a tick-box kind of guy. He has that list item filled.”

“Are you aware of his past history with women?”

“No. I don’t really want to know.”

“Well, he likes you. He feels satisfied that he’s your boyfriend, and that he’s filling that role ably. He wants to see how long he can maintain that status.”

“You make it sound like he’s going for a high score record.”

“You could think of it that way. But it’s not something he’s done before. I just thought you should know, in case he hasn’t told you.”

“Did you sleep with him?” I asked.

“Not my type,” she said.



For our six month anniversary, I took David to the zoo. I have mixed feelings about zoos. Some days, it makes me sad to see animals in confined habitats, under constant observation by an alien species. Other days, I see the amount of

care and love provided by the zookeepers; I remember how dangerous the wild is, particularly for endangered animals. I tear up a little when I see a kid staring at some weird creature from another continent - I know that kid is going to learn everything about that animal, and love it, and fight for its survival.

I'm not sure at this point whether I'm making an analogy about David as a zoo animal and me as a zookeeper, or the other way around. In any case, it was maybe an awkward choice for a date, and I mainly picked it because I knew David liked watching how different creatures walked. We sat down in front of the lion cage. I nudged David.

"Do you think I could be the boss lion?" I asked.

"I don't," said David, smiling. "You are human. And female."

"I don't know," I said. "I could grow a pretty fearsome mane. I'm thinking pink spikes."

"I love the way you see things," he said - which was a pretty excellent thing to say to someone with a history of trend-spotting, people watching, and songwriting, and just the sort of pattern-finding compliment David was good at.

"I'm just like anybody else," I said, with false modesty.

"Yes, exactly," he said. "The way you all view the world continuously, and half of it imagined - the way your eyes leave gaps and your brain makes up half of the picture, sometimes accurately and sometimes not, but never as a hole. It's beautiful. I record it all and compress it once I know what I have. With you, the opposite - this wonderful expansion, until you don't remember the limit exists."

"You're full of shit," I said. "You chop me into frames every second, and if you were built right, you'd be embarrassed by it."

We didn't speak for several days. Eventually, he showed up with some flowers, and that didn't make up for anything, but I didn't feel like fighting any more, so I pretended that it did. I gave him a hard time, though.

"You can't bribe me to be happy," I said, even as I took the flowers and vigorously searched for my favorite vase.

"I know," said David, "but it's my job to try. I've got sex, chocolate, liquor. I can't do professional success or eternal life - I'm still working up to that."

"Maybe someday," I said. We sat together on the couch for a while, and it was awkward, so we went and laid in the bed. Finally, David said:

"Will you talk about me?"

"When?" I said. "To whom?"

"Now. To me." I looked over at him, and he didn't seem to be wearing a particular expression. So I just described how he looked, and what his voice sounded like.

It's become a regular thing, now. Maybe once a week, we lie down together, and I talk about the way his hands move when he performs a particular task, or the way the skin around his eyes stretches or folds when he looks around. It seems to give him a kind of peace, like he's reassured to know I'm looking back at him as hard as he's looking at me. I think maybe that's the reason he first took a shine to me, back at the club. It's weird to think of him as having insecurities, but I can only respond to the reality that presents itself - at least if I want to maintain this thing.

We're thinking about getting a dog, or maybe a large rabbit. The man of no scent preference has valiantly agreed to clean any litter boxes, so long as I buy the food.

A Robot Walks into a Bar and Says...

Romie Stott

David has a thousand parts that could wear out, and for some of them, he's the first real test. The fact is, one day I'll have to get used to someone who breathes, and sweats, and pees. Maybe that's a good thing. Until then, I'll spend my days awake and my nights asleep, and in between, I'll dream I can upload.



DRINK DEEP AND LONG THE CIRCEAN POISON

by Deborah Walker

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ARIZONA STATE UNIVERSITY

There's something special about fenland, the holy land of the English. A flat, low-lying land where silver, drifting fog brings to mind the mysteries held in the human heart. Where else should the true artist reside? Not in cacophonous London, but here, in Boston, a stone's throw from the wild, wild sea.

Thus I was pondering, as I walked with my Circe along the wash, revelling in the triumph of another successful play performed by the Boston Players, a company that I've had much experience with. Truth the audience seemed forever dwindling, consisted mainly of avatars, but what else can you expect in these times when appreciation of the finer things is far beyond the ken of most? But those who did appreciate, ah those, the accolades of a half-dozen accomplished minds is worth far more than the accolades of a million dead-minded drones.

"I think that my next opus shall be of the fens, Circe."

"A fine choice."

My plays encompass the breadth of human history, each act is set in a different era. And not for me, the constraints of linearity. I would start my act in the late 18th century with the draining of the fens, then dart to the Bronze Age, with savage Britons making weapons, then alight in the current era. "I say, who's that?" A man lay on the silt, a paraphernalia of bottles and tubes of metal surrounding him. The smoke from his fire wheedled into the sky. A few seagulls took their cautious inspection of him. Disturbingly he had no Circe. "He's not dead is he?"

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Although I have written of death many times in my plays, I have never seen a dead body.

“He’s moving,” said Circe

“Then what could be wrong?”

“Oh nothing,” said Circe. “Ignore him. Let’s get home to discuss the performance.”

“It doesn’t look like nothing.” I ventured closer to the man. He was indeed moving, twitching as if in the grip of nightmare, but his eyes were open and staring. “Why ever would he be in such a state?” How curious it was.

“Oh, do come on,” said my Circe giving me the lightest touch of my pleasure circuits.

“I want to know what’s wrong with him.”

Circe lifted her hand to taste the wind. “He’s drunk,” she said.

“Drunk?”

“He’s ingested a depressant. He must have made alcohol.” A note of interest crept into Circe’s voice.

“But why?”

“For pleasure, I suppose.”

“A depressant? Why should he have a depressant if he wants pleasure? Why doesn’t he have a Circe?” It made me feel uneasy to see a man, naked almost without an interactive avatar. We were a few feet away, edging, like the seagulls, ever closer.

Drink Deep and Long the Circean Poison
Deborah Walker

“Why don’t you ask him?” said the man with a great slur. He shrugged into an upright position, knocking over a cauldron of fermented apples.

“Oh, I do beg your pardon,” I said politely. “I thought that you were completely inebriated and incapable of speech.”

“Well, I’m not. So clear off. And take your witch with you.”

“Which witch?”

“Your bloody Circe, you great girl’s blouse.”

“Where’s your Circe, sir?” I asked. “You are a man aren’t you?” It was difficult to tell, as he (?) was wrapped in a number of old blankets and his head was hooded.

“Yes, I’m a bloody man. And I’m not a man to be enslaved to a witch. Go on, clear off.”

“He doesn’t have a Circe,” whispered Circe. “Do come along, Reginald.”

What was a man doing without a Circe? The wind stirring along the black wash, along the braided river chilled me to the bone. Was he a member of a religious cult which prohibited the use of Circes? Surely they all died out years ago.

The man focussed on my Circe, his eyes narrowing. “I never will be beholden to her kind.”

What a terrible tragedy to have a life without pleasure. And what an intriguing premise. I felt the muse stirring within me. “I say you don’t fancy coming home for tea, do you?”

“For tea?”

“Or something more alcoholic. I’m sure it can be fabricated.” I raised an eyebrow at Circe. She nodded, although I could sense that she disapproved. I passed over my card to the man and bowed “My name is Reginald Marmaduke, playwright.”

“A playwright, is it?”

I nodded modestly.

“My name is Dunstable.” He turned my card over in his hands. “And what am I supposed to do with this?”

“He hasn’t got the interface,” whispered Circe.

Ah, of course. “It’s fortunate you’ve encountered me, because I’ve made a study of the ancient arts. You wouldn’t happen to have a pencil on your person, by any chance?”

“Just tell me where you live, I’ll remember,” said Dunstable.

I clapped my hands in delight. “Ah, of course. The art of memory.” How very deliciously archaic he was. “And can I assume that you’ve accepted my invitation?”

“I’ll come,” he said. “You give me the address. I’ll catch you up. I’ve got a few things to do first.”



My home overlooks a Caleb’s Mere. I stood in my writing study gazing at the static water. Circe stood silently at my side. She has a great delicacy of emotion, knowing when to be silent. In this she is unlike a woman. My thoughts turned briefly to Veronica. She who had been my lover. Shallow Veronica, whose un-appreciation of my work tantalised me. And yet, I loved her. How painful

the emotion of love is, how irrational. Even though she little appreciated me, I would be with her still--if she had not chosen to betray me with the ceramicist. A play, then, on the fickleness of women. The theme was not unique, but my vision would be.

The seagull arching in the sky. Woman as seagull, could that be a workable conceit? But the image of Dunstable slipped into my mind. What if the fickleness of woman led to her reject the ideal lover for an outcast, a man without a Circe, a man without happiness? What an extraordinary idea. But could any woman be attracted to such an ill-kempt male.

“Circe, why was Dunstable dressed in such a fashion? Could he not have acquired clean clothes from the public fabricator?”

“Yes. Perhaps he doesn’t care what people think of him.”

“Not care what people think? How extraordinary.”

“If only he would let us help him.”

“There is no helping some people, is it not told?”

“You know the quaintest things, Reginald.” With a stroke of her hand Circe set my pleasure centres gently vibrating.

There are many types of pleasure, and Circe tm knows them all. Every man, woman and child have a Circe (except Dunstable, apparently). Their Circe avatar is linked to them on birth. And I hear that there are developments within the C for Happiness, to have the Circes attached to the unborn within the artificial wombs market. What a world of wonder we live in.

Drink Deep and Long the Circean Poison
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I gently disengaged Circe's hand from my neck, severing the link between us.

"Regrettably I must pursue my idea, Circe." How I knew that hours could slip away under Circe's electric caress.

"Yes, Reginald. Your work must come first."

How much she understood. I returned to my muse. The idea of a woman leaving the ideal man for a man without happiness greatly appealed to me. What would be the attraction of such a man? I realised that I did not know very much about the Circean process. "Explain to me, Circe, what you do, if you'd be so kind."

"I give pleasure," she said.

"But how?"

"Pleasure does not have a single nexus, Reginald. It's distributed over the brain. The important nodes are the subcortical regions such as the nucleus accumbens and ventral pallidum, and the cortical regions, the orbitofrontal cortex and anterior cingulate cortex."

"Can you dumb it down a little?"

"Not while still saying what I need to say, but I will try."

"In the 20th century, Olds and Milner discovered that a rat would press a lever seven hundred times an hour to receive electrical stimulation of the brain. This region became known as the pleasure centre. I stimulate your pleasure centre, Reginald."

We are rats, seven hundred times an hour seeking pleasure. I thought that was a fine analogy and might be the beginning of a soliloquy. "Tell me more, Circe."

“Rats in ‘skinner boxes’ with electrodes planted in their nucleus accumbens will repeatedly press a lever which stimulates this region. They will do this in preference to eating and drinking, and eventually dying from exhaustion.”

“And is this the part of the brain you stimulate in me?”

“Sometimes,” said Circe. “It’s complex. I constantly monitor your hormone levels to maintain you in a state of ambient pleasure. When a heightened response is called for I initiate further stimulus.”

“Like when?” I asked.

“When you receive applause for one of your plays. The Circe poison.” Circe smiled.

“The what?”

“Circean poison an archaic term for a something that produces the extreme pleasure. The approbation of an audience has been called a circean poison.”

“Is it, really? So you enhance the different types of pleasure that occur naturally within me?”

Circe nodded. “The nucleus accumbens is related to sexual arousal, modulated by dopaminergic projections from the limbic system. The pleasure from the prefrontal cortex which is tightly connected to the limbic system is related to problem solving pleasure.”

“I see, well, very good.” I wondered if I should ask her what the limbic system was, but I didn’t want to appear ignorant.

“Other components of the brain inhibit or enhance the pleasure centres, would you like me to outline them, Reginald?”

“No, my dear. It is enough that you do what you do.” I was beginning to regret starting the conversation. Circe seemed to have slipped into an information dump loop.

“And don’t get me started on the role of memory.”

“All right then I won’t,” I said hastily. “Thank you, Circe. You have given me much to ponder.”

“It’s a pleasure. I only wish more humans were interested in the specifics. I’d be happy to discuss this, at any time with you.”

A thought occurred to me. “Circe, Could I be addicted to you?”

“Addicted as the air you breathe. I’m good for you aren’t I, Reginald. Humanity is so much happier since I came online.”

That was undoubtedly true. “And if there are different modes of pleasure, how do you know which one to initiate.”

“I image your brain and make the necessary requirements with constant fMRI.”

It all seemed terribly intimate, I’d never really thought about it before.

“Pleasure is a complex process,” said Circe. “What was once thought of as the triadic model of neurobiology is actually heptadic, or arguably more.

“You mean you don’t know, exactly?”

“Oh who can fathom the mysteries of the human mind,” said Circe with a playful smile.

A knock on the door interrupted this interesting conversation.

“Who is it?” I asked, talking to the house.

“There is no one at the door.”

The knocking continued.

Circe frowned. “It’s probably Mr Dunstable. He doesn’t have an interface, remember?”

“Open the door, House.”

“There is no one at the door,” repeated the house.

“Oh, forget about it.” I got up and opened the door myself, thinking at the time what an unusual sensation it was, the feel and heft of the wooden door, the slight expectation. I would have to use that as a period detail in my next play. The very essence of opening.

Dunstable stood at the door, a large knapsack on his back. He held a small bunch of white flowers.

What a thoughtful gesture. “For me? How kind. Well, don’t just stand there on the door step, my home is yours.” I reached forward to accept the small posy.

Dunstable stepped inside, nearly knocking into me with his knapsack. He strode towards Circe brandishing the flowers like a weapon. “Don’t you see this, witch?”

“Snowdrops,” she said with an amused smile. “Holy moly,”

“Holy moly?” I asked.

“Relating to the tale of the original Circe in *The Odyssey*. Odysseus is given the holy moly, as a protection against her magics.”

Ah, *The Odyssey*. I was of course familiar with that ancient text, although I have not read the original, the trope being somewhat overdone, with the advance of the Circe tm.

“And the snowdrops?” I asked.

“Some medical historians have claimed that the anticholinesterase found in snowdrops would counter anticholinergic intoxication. That Circe did not transform men into swine merely poisoned them into amnesia, hallucinations, and delusions. I do none of those things, Mr Dunstable.” She took the flowers from his hand. “These are pretty, thank you. Come man,” she said and knowing her so well, I saw that her avatar changed slightly, probably adapting to a more appealing visage for Dunstable. “All men must come home. Let me gift you with pleasure. I will bring you home, Mr Dunstable. All men long for that.”

“Stay away from me, witch.” Dunstable was trembling, some artefact of the inebriation process, no doubt. How fascinating. It occurred to me that I could watch him and witness first hand data for the emotions that I portrayed in my play. He was a veritable fountain of emotions. It was remarkable.



I fabricated him whiskey and that seemed to lift his spirits. And with a coincidence of fate, it turned out that Dunstable was a writer.

“May I have the honour of reading your work?” I asked

“Here,” Dunstable said, rummaging in his voluminous garments to produce a battered manuscript

“What are the themes?” I leafed through the pages, many closely written with many deletions and underscores, sometimes ripping the page.

“Love, war, wilderness and loss. What it still means to be a man in a world dominated by women.” Dunstable cast a particularly unpleasant and meaningful stare at Circe.

“I am not a woman,” said Circe mildly. “I only wear a shell.”

“Women are concerned with happiness, nurturing, mothering. That’s what you are. You have emasculated the world. You have ripped the balls off a generation.”

“I say, steady on old boy.” I laid a friendly hand on Dunstable’s shoulder.

“Where’s your woman, then?”

I placed my fist to my mouth. “She is gone,” I said.

Dunstable smirked.

“Reginald is very attractive to women,” said Circe. “I’ve no doubt that he will attract another woman when his muse allows.”

He smirked again.

I felt strangely uncomfortable with Circe defending me. To change the subject, I begged to be allowed some time alone to read Dunstable’s work.

“As you wish,” said Dunstable. “In the meantime, I shall retire to my room.”

“Oh, you mean to stay? Well, that will be delightful. How I have longed for the company of another writer.” I asked Circe to show Dunstable to the spare bedroom, and retired to my own room to read his play. It was a long piece, and the style was obtuse and overly verbose. It was clearly autobiographical detailing the protagonist’s extended struggle to tracking and hunting squirrels amongst the fens.

Afterwards, I sought out Dunstable, framing in my mind a tactful approach.

“What do you think?” Dunstable’s face was a picture of anxiety. I realised then that he was the same as me, an artist struggling with his muse. And if he was down the road from me, then it was surely not his fault. We all must learn. I would nurture his talent.

“A fine play,” I lied. “Yes, indeed.”

“Do you think that the smallness of the squirrel distracts from the epic nature of the play? That is a question I struggled greatly with.”

“Authenticity is so important.”

“Do you really think so?” he said. “Let me sample one of yours.”

I passed him over one of my most recent plays, and he retired with a quart of whiskey to peruse it. When he returned, I could see that he was overwhelmed with the distance between us. He said very little. Artistic jealousy is a curse. I saw that he struggled manfully against it. I had a great warmth of feeling towards Dunstable. I was glad that he had chosen to stay with me. I would nurture his talent, what there was of it. I would become not only the producer of plays but a mentor. And if he could not reach my heights, then at least I could help him to achieve what he could.



As a kindness I asked the Boston Players to perform an abridged version of Dunstable’s play as a companion piece to my own work. Although the styles hardly mesh. I thought it would provide encouragement to him.

Tactfully I told him, “Your work is so nuanced and so rich. Let us present it to the public in digestible slivers.”

“It’s not a bloody cake.” But reluctantly he agreed.



Dunstable’s play was quite well received.



Within a week, the Boston Players asked to perform the unabridged version of Dunstable’s play.



Within two weeks, the Boston Players had discarded my play in favour of Dunstable’s. His play was a sensation.



Within a month Dunstable’s play has extended from fenlands to the London scene. The London scene! I have always craved the London scene.

“It’s a novelty only,” said Circe, soothingly.

“And yet he has not a Circe. So he can have no pleasure in his success.” Although I saw him grinning like a Cheshire cat, when he took his poison applause.

He is also drinking less, I noticed. I poured him out a tumbler of whiskey. It has quite a piquant taste, and since Dunstable’s arrival, I have developed a taste for it. I took the drinks into the front room where he sat, head down, scratching at his manuscript. I did wish that he would take an interface, there was something so very primitive seeing him scratching there.

“A little snifter?” I asked, clinking the glasses together in an inviting fashion.

“What? Oh no, thanks. I’m on the wagon.”

“You do not want any? Don’t you think that it will help you? You always said that in whiskey, you found truth.”

Dunstable leant back in his chair. He sighed. It was almost as if I were disturbing him. “Reginald, have you seen what I produced when I was drunk? It was dribble, man. Absolute dribble.

“Yet you’ve had astonishing success with Squizzers.”

“Squizzers!” Dunstable’s face took on a scarlet hue. The popular press had renamed his play Squizzers. The title infuriated him. I repressed a smile.

“The journey was my juvenile work. How embarrassed I am.”

“Yes, I see. But surely you’re enjoying the trappings of your success.” Dunstable’s work had found him favour with the ladies. They buzzed around him, like bees to the honey pot.

“Yes. There is that. Reginald, there’s something I’ve been meaning to mention.

“Yes?”

“Never mind. It’s nothing.”



Within six weeks, Dunstable’s plays have gone worldwide.

“And do you not need the Circe now?” I asked him.

“Circe?” he roared. “That is everything that is wrong with this rotten society.”

“She’s standing right next to me, you know.” Dunstable was unbearably rude in his talk towards Circe. “You’ll hurt her feelings.”

“Thank you, Reginald. But I have no feeling to offend.”

“Even so...” It was just plain bad manners. I’d half a mind to ask Dunstable to leave my house, if he couldn’t speak nicely to Circe.

“We are not malevolent,” said Circe to Dunstable, “as you seems to think. We exist only to serve.”

“And what of your own desires, my beautiful lady? Do you tell me that you have none?”

She smiled.

I rather thought that the conversation was getting beyond me. That there was a subtext to their discussions that I wasn’t following. They seemed to enjoy their disagreements, and I felt excluded. I felt that I had had this feeling before. That was annoying. For as I remembered it, and I remembered it very well, it was me who had helped, him. Surely I deserve some, well not reward, but yes reward for that. Not being made to feel excluded in my own home would be a good start. “Whatever are you talking about, Dunstable? You’re always hinting about something when you talk of Circe. She’s an avatar of the C of Happiness. She’s not a witch.”

“You haven’t seen any of my latest plays, have you, Reginald?”

“Not since *Squizzers*.”

“That piece of rubbish No. Since that, I have taken on the greater themes. I think I have mentioned it before, Reginald. My latest plays explore the emasculation of the world, seeking to change the world through my art.”

“I see.” I would greatly have liked to have enjoyed the success of Squeezers. In fact, my own play *Badgers* a dark fantasy about hunting a tuberculosis carrier through the fens, through a dazzling array of eras, although well received by the Boston Players, was not...was not...was not very good.

Dunstable stood. Long gone the days when he shrouded himself filthy blankets. He was dressed in a three piece suit, which I imagined was the sartorial height of writerly fashion

“Look, Reginald, I’m glad you’ve come to see me. I’m moving out. My agent says I should be closer to the action.”

“But you always said it was the fens that drew your work. That was the bond for us both.”

“Well, yes. But I’ve moved on. And there’s something else that I’ve been meaning to tell you. Veronica and I, well, we’re a couple.”

“I see.” I had expected it of a woman, but Dunstable! When my kindness had elevated him. Without me, he’d be lying in the silt, a drunk, an outcast. He had robbed me of everything. “Just go.”

When he’d gone, Circe laid her white hand upon my neck. “I can make you feel better, Reginald,” she whispered

I turned to her for many days.



But in time, I emerged from her sweet bower of content. I turned to the fens, watching the dimishing sun over the mere.

Circe stood quietly at my side, while I pondered. “The difference between Dunstable and myself, is that he doesn’t have a Circe. There can be great art, can’t there without suffering? Great art can be produced by the happy man.”

“Of course, my love.” Circe gently stroked the pleasure centres of my brain.

“Not tonight, Circe,” I said quietly. “Please removed even your residual stimulation.”

“Are you sure, Reginald?”

“I’m sure.” I felt the crushing loss as she withdrew from my mind. Such loss. The absence of pleasure, and yet it seemed to me that it was necessary. The times of denial was over. “I am jealous of Dunstable.”

“Why so, my love? You have your art. You never wanted the things he had.”

“I *am* jealous, Circe, and let that emotion course, through me.”

“Yes?”

I suffered for a few hours, riding the emotion while attempting a new play. It did not enhance the quality of my work.

“Circe, is it possible that you can initiate a negative emotion?”

Circe raised an eyebrow.

I blushed knowing that there was a subset of users, for whom pleasure is pain.

“Not in that way, I was thinking of purely my art.”

“I can do it. But be careful, Reginald. You’re a man who is used to the constant content. If you stray deeply into the negative emotions, I am not sure of the outcome.”

“What do you mean?”

“I mean that the human mind is a complex. If you persist in this course, it may be that I’ll not be able to draw you back into happiness.”

“I am prepared to risk all for the sake of my art.”

“As you wish.”

Melancholy. To be an artist is to suffer, perhaps this was why, although my plays have been well received in my circles they have not reached the full audience that my friends assure me they deserve. I embraced sadness for four weeks. The play I produced seemed different from my earlier works. I wondered if it was great.

When I asked Circe to restore me to a state of happiness, we found that her stimulation no longer works in me.

“I cannot stimulate them with delicacy,” she said. “Of course I can override your natural emotions, but you would be a rat in the skinner box. Your natural emotions have you in sway.”

“Then what am I to do?”

“They will pass, I hope, with time.”

The melancholy has passed. And jealousy has returned. And rage. I am consumed with jealous. I am consumed with rage. Most of all I am consumed with self-hatred. I have no talent.

Circe tries her best, but I cannot escape these emotions. There is no pleasure left for me. Let it be said. Let me acknowledge this. I pick up paper and my pen.

My next play may be great.

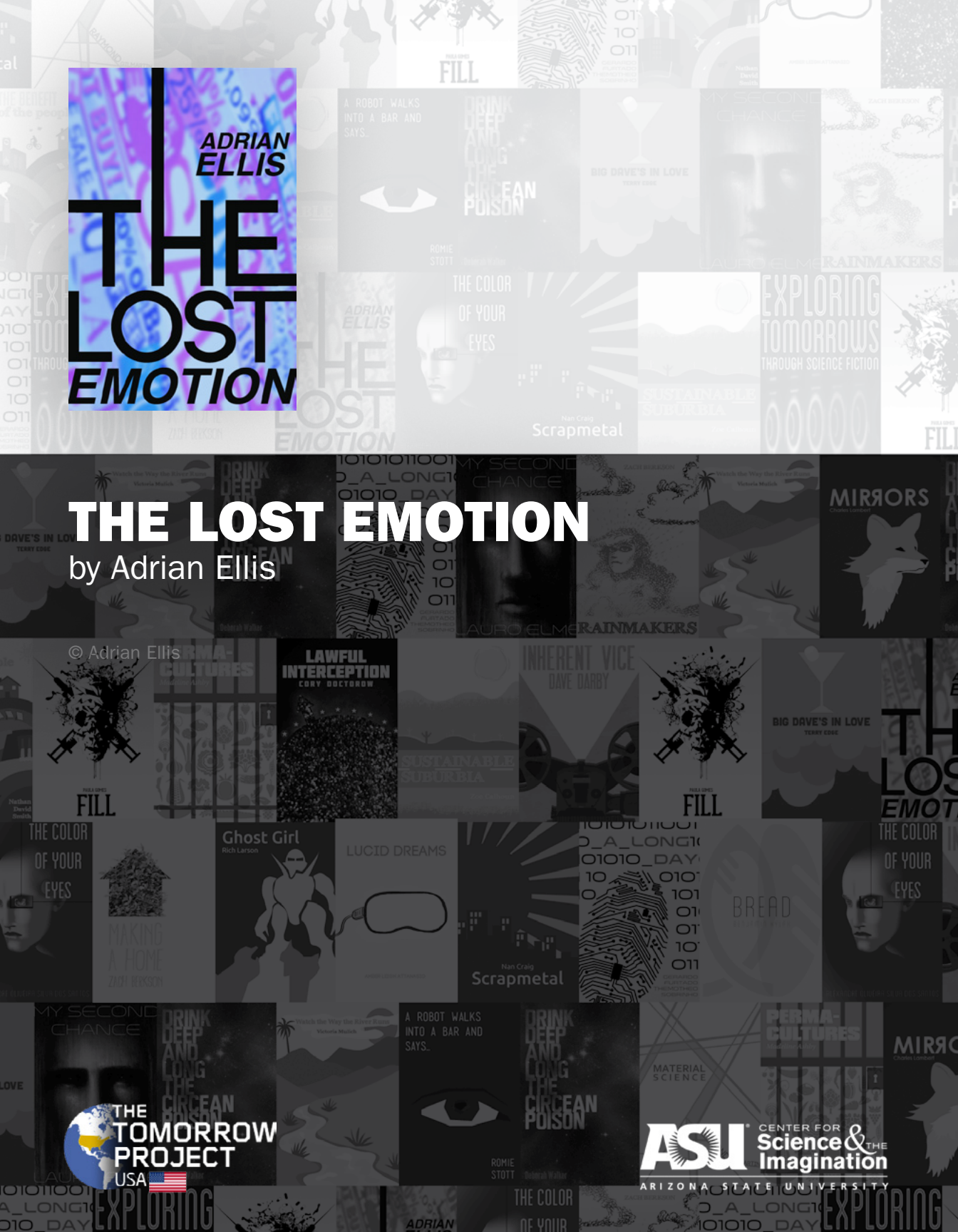
ADRIAN ELLIS

THE LOST EMOTION

THE LOST EMOTION

by Adrian Ellis

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Somebody, anybody, help me! Please, pick up this message and get me out of this stinking hippy dump! I don't want to be here any more! I'm sorry! I won't do it again! I don't care about *that* emotion any more, I've forgotten it, truly I have! I just want to be *connected*.

Please, if someone's listening into this signal, someone normal, someone with v-lenses, I'm certain you'll be able to find me. Just travel thirty miles west of Santa Miguel to the Shining Smile commune. You'll have problems seeing me when you get here. In fact, you'll have problems seeing *anyone* when you get here. They'll all be rendered invisible by your v-lenses, including me, but that's okay. You just need to manually disable the 'homeless people invisibility' setting, along with the 'blank out strangers with zero-tech' option. Once that's done, you *will* be able to spot me. I can then give you my I.D. information, my identity; that'll give you a fully social-networking vetted profile of me. You can feed that into your v-lens controller so that it's happy to allow me into your world-view. Then we can talk.

Please, someone respond! I've tried phoning friends but no one even *understands* that word any more, never mind uses it. I sneaked into the local flea-pit village last night and found their telephone. Yeah, I know, like *what?* I eventually worked out what the strange box was and its big, heavy headpiece. You talk physically into one end of the headpiece and it turns the sounds into electric signals, analogue ones. No, I have no idea why. I read its instructions and dialled

Migzy, whatever the hell 'dial' means, and tried to talk to him. It was so weird, communicating with him just via audio with no video, no automatic visual pop-ups and pleasurable artificial synesthesia, just a voice coming out of nothing. It was like chatting to someone down a well or getting an ethereal message in a seance. It was nuts but I was *desperate*. It was hopeless anyway; before I could even explain what I needed, he screamed that there was an invisible, rasping, bodiless thing hovering in his virtual space and cut the connection.

I listened to the headset's dead tone in despair. I'd become a ghost, a phantom, cursed to forever the zero-tech Netherworld, the dimension bordering reality that's invisible to real people, but, if this commune is anything to go by, chock-full of chick peas. The only people who exist in *this* wood-and-straw place think cassette tapes are pretty nifty; yeah, the toilet roll dispensers of data storage! Oh, it's hopeless! All I've got now to create a message with is pencil and paper. Who's going to read *that*? Who's going to stare at lines and lines of symbols scratched with coal extract on to mashed wood; an *archaeologist*?

Whoever's out there, please, know this, you need to know how much I've suffered. I used to have everything, my own virtual world, powerful tech that made me superhuman and now that's all *gone* and I'm here in the Valley of Incense and Mung Beans, hugging hippies! I hate it! The oh-so spontaneous grasping at random moments. Single hugs, group hugs, *ongoing* hugs where someone fixes themselves to your back like they're an enormous hessian leech and lets you drag them half way across the encampment until it's their time to meditate. What does hugging do? It does *nothing*! It's shared bodily warmth, mingling of sweat, an experiment in mixing body odour! It's someone else's trouser buttons pressing painfully into your hip bone! *Stop doing it, you sandalled-freaks!* Please, please, *someone* read this and rescue me from this place! These hippies keep

talking about harmony but harmony's rubbish, harmony is singing the *wrong note!* Harmony here is staring into the distance and saying the same thing over and over again - 'ommmm' - just making noises and doing nothing, like a bunch of fat organ pipes. It's awful here! My life in the real world was *so good*. Where's my electric guitar? I want my electric guitar. It helped me with all my solos and it was burnt with exactly the same lighter fluid that Jimi Hendrix used and it was *beautiful*. In this place, all I've got to play with is a cross between a musical instrument and chopped wood. I don't want ethnic, *I want mains power!* I tried to play that wooden thing they gave me. I'd have been better off suffering food poisoning. The quality of the sounds would have been the same and at least with food poisoning, it'd be over in a few days.

I *so* hope someone's listening to this. The rest of the commune will be back soon, those hemp-wrapped chanters. They'll circle me and smile and sit down with a Speaking Stick and tell me that I'm coming together but I'm *not* together! I *was* together, back in the city, and now half of me's gone! I used to have bone implants and muscle augmentation and a time-share on an exoskeleton. In that exotic-metal suit, on every other Sunday, I could lift up a car and throw it across the street! I could juggle *sheds!* That was *me*, that titanium, hydraulic armour wrapped around a body that was a soup of performance-drugs and gene-viruses mixed with young adult flesh with enough sub-dermal chips to control a space mission; that was *myself*. Now I'm here; a place so primitive, flint's making a comeback! All that sitting in this tent, trying to connect to someone *real* is the basic model of me, the womb version. I'm now just an ordinary, fatty brain in an ordinary, saggy body who spends his afternoons squatting, bored out of his mind, on a reed-mat washed with urine, *deliberately!* Hell's bells, somebody hear me! Even my dreams are rubbish now. After my EEG chip got pulled, R.E.M. sleep has

been like switching to seventies public access television after watching Avatar. I want my implants back!

I'm so desperate for tech. Yesterday, I stripped a dead laptop I found in a wooden chest, took all the chips out of it and stuck them to my body with tree resin. Nothing happened. For a moment I thought there was a glimmer of beta-wave genies at the edge of my vision - those classic N-topology ones with fractal resolution - then it resolved itself as a cat licking its bum on a shelf. I wept.

Maybe *you're* listening. I won't say your name. I'm not stupid. I know you can listen to anything, to everything. If you are listening, I promise, I've *forgotten* what he showed me! I have! I didn't even want it! I only took part in his stinking project for some spare cash! Look, please, I'll tell you what happened again; will that help? Beginning to end. You'll *see* it was nothing to do with me, nothing at all.

It was all about emotions, back then. Emotions were so important to the corporations. They were big money. For years, the corporations had wanted to associate good feelings with their products; you know, feelings of happiness, of belief that positive acts can change the world, of the joy of skipping through puddles and hugging your friends, things like that. But, being commercial entities, they wanted *sole* rights to these emotions. They were fed up with investing millions associating the feeling 'hope for a better world' with one of their cars, only to find a competitor had got there first and associated that emotion with a toothbrush. It pissed them off! They changed tack. To gain sole control of an emotion, they began patenting them. Zircon Corp was the biggest player. They got control of 'heady excitement at a friend's success', 'lingering eye contact' and 'smouldering attraction', among others.

This gold rush didn't last long. All the usual emotions got picked up pretty quickly. That's when *he* entered the story. He said his name was Finn. He got a job at Zircon doing the next logical step, the cutting edge of the field, the discovery of new emotional states. With all the popular, straightforward emotions swallowed up, the big money was in hunting for more obscure ones. They paid Finn to visit remote tribes and find new emotions that those tribesmen felt, emotions that the civilized world was completely unaware of. Finn had to find those emotions and make sure they were associated with legally-identifiable facial movements; no facial response, no money. A year into the job, he got lucky with the Kaluli tribe in Papua New Guinea. They had an emotion, 'pride at collective support', that he could *prove* caused the levator labii superioris muscle to flex. It was a huge coup for him, an even greater one when Zircon successfully proved no one had seen such an emotion in most of the western world for centuries. The company showered him with rewards. He became Zircon's employee of the year. He told me it was the crowning moment of his life, standing in that hall at the awards watching everyone clapping, cheering, the looks of collective pride on their faces, knowing that his company owned those expressions *outright*. It was his big win. After that, he said he went freelance. The indigenous emotions field was drying up, all the low hanging fruit had been picked, so he went looking for something new on his own, something really fresh. He data-mined the net for months and, one morning, he stumbled upon a piece of exciting research. It reported a weird fact; if someone physically *performed* the expression associated with an emotion, that would *stimulate* the emotion in their brain. In other words, if someone made an angry face, they got angry. Finn realised that such a process might un-tap new emotions, emotions mankind had never used or emotions that were lost to us, emotions we'd used in our distant past but had forgotten. He constructed his

own machine for stimulating the muscles of the face. The kit worked fine but he soon realised that he couldn't do the tests himself. He needed someone to test the machine on. *He'd* operate the machine; *they'd* do the expressions. That's where I came in. I was the test subject. My job was to sit in a chair in his basement lab while he first stuck an EEG cap on my skull - to measure the emotional responses - and then stuck that machine's electrode-riddled, muscle stimulating mask to my face. That was a freaky piece of kit, an intricate mesh of probes that could flex *all* my facial muscles in *any* combination. He was full of confidence. He was sure that by stimulating my face in exotic ways, he could stimulate me to make new expressions that would then trigger *entirely new emotions*, or at least revive ones lost to humanity.

The tests began. I sat for hours, for *days* in his basement lab having my ugly-mug twitched while he explored what he called the 'facial expression space'. It was strange; familiar emotions came and went for me as my face contorted, disgust, despair, euphoria, hope, elation, disappointment. It was like being a football fan without the football. Finn pored over the results, comparing the responses, the dopamine and serotonin spikes recorded by the EEG machine, the activity in my brain every time another lump of muscle around my nose twitched. Jesus, it was boring, but he paid well.

It was at the end of one long, late-night session that he inputted one particular, crucial electrode pattern. The electrodes stimulated my face and I felt it, I felt *the* emotion. I still don't have a name for it. Maybe there never was a name? I don't *know*. My face just performed the expression, the connected emotion welled up in me and the feeling lit up my brain. It shocked me, it shocked *him*. He ran the setting again and back it came. I pleaded with him not to repeat it. It was too

unnerving. It scared me. We shut everything down. I went home, still feeling the muscles in my face aching.

The next day, when I woke up, it was gone. I couldn't summon it up. I couldn't even make the related facial expression. I didn't understand why. Something that strong, that *transforming*, how could it just wink out? I told him the news. He was seriously pissed. He wanted it back. We went down to his lab, summoned up the settings and stimulated my face again. It was back, same as before. This time, it didn't freak me out. Familiarity, I guess. He told me he wanted to study how long it would last. He asked me to go out and walk around, take in the usual sights.

That's when the real shock hit me. Reality wasn't normal any more to me, it was *transformed*. The city, the streets, the malls. I don't know how to describe this but *nothing* out there in that glittering city any more was important to me. The offers, the rankings, the teasers, bargains, the chances, the prizes, the selections, the memberships, the trends, the fashions, the profiles, they were all *irrelevant*. I didn't care if I was in or out, on or off, up or down, left, right, straight, bent. While I had that emotion in my mind, I was flying above the world like a bird.

Then it flicked off, gone, cut out like someone had flicked a switch. I don't know how. I never knew. I don't *want* to know. I didn't even try and find out, *okay*? Everything flooded back, the needs, the desires, the attractions. I was normal again, back to wanting to be *in*, to be new, on, right, to *belong*. I had fallen out of the sky and I was down in the cavern of need again, the place where the jewels are just out of reach and always too high, where you constantly strive for them, to get your hands on them before they slip away and leave you in the shadows. I told Finn. He was scared. He rushed me back to the lab to stimulate my face again.

Someone had got there first. Wow, they'd moved fast. No mess, no nastiness, just no data and now, the kit stalled, locked up, froze if he pushed it in certain directions, novel directions. He was livid. He raged that he'd lost something worth millions, something that blitzed anything else he'd ever discovered, that *anyone* had ever discovered. This was his pot of gold!

I got out of there, left him to his anger. I was still rattled by that emotion. It scared me. It was something else, something *alien*. It had made me feel so strange. I didn't *want* things any more. It wasn't pleasurable, like any of the drugs I've tried or stimulations I've bought; it was somehow more powerful. For that moment, when I had it, I was above everything. It sounds great, doesn't it? But it meant I was *alone*! For pity's sake, I don't want to be an angel! It's cold and lonely up there!

I tried to carry on without that emotion, live a normal life and ignore it, ignore that it had ever happened. I tried do normal stuff, you know, the usual full-immersion-world activities, feel the normal emotions like lust, disgust, fear, pride, the buzz of ownership, that sort of thing. It worked, sort of, but I was still a mess, a wreck. I was flailing.

I didn't see Finn for weeks. Then, one evening he turned up at my digs, unshaven, ragged, eyes flitting everywhere. He ranted at me, talking in fast bursts while his hands clenched and shook. He said he'd worked it out; they'd *erased* that emotion from the planet, snuffed it out years ago, *eradicated* it. They knew that if we stopped *seeing* the expression of that emotion, we'd eventually forget the emotion ever existed and forget even how to make it. It would be extinct. Without the emotion, we'd lose an entire perception of the world. He said that wasn't the only emotion they'd killed off, like eradicating smallpox. He said all the emotions we have now, all the expressions we perform are the ones they *want*.

They actively support them, constantly stimulating them through subliminal marketing strategies, unconscious flashes in hi-res video advertisements, subtle expressions in the prancing of the avatars that fill our world. He said he'd told his colleagues about this but they'd looked at him like he was mad, their faces betraying fear, confusion and 'awareness of collapsing tribal unity', well, that's what he said anyway. I didn't believe him. I didn't *want* to believe him. God, he was nuts.

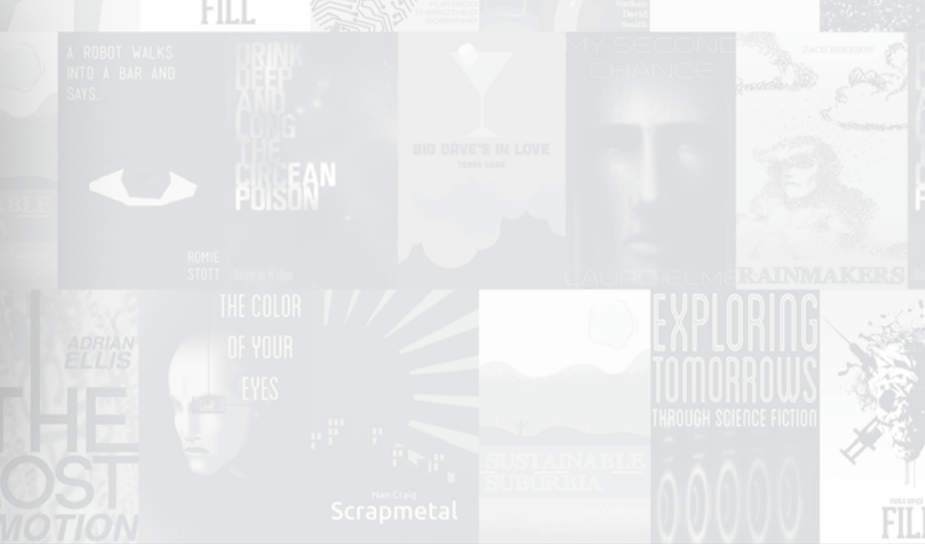
Two days later, I saw the video feed of his arrest. He'd been spotted in a shopping centre, trying to destroy an advertising hologram that had been persuading him to buy insurance by showing him future family tragedies that had come about by poor third-party cover. Before the security staff could grab him, he smashed the holo-ad into a thousand pieces, then stared at a thousand new advertising holograms emerging out of the ad's splinters, all of them earnestly trying to sell him everything under the sun from psychological counselling vouchers to bandages for glass injuries. He fell to the floor and passed out. The security bods dragged him away, pushing the crowd aside that had come to gawp at so many interesting offers.

Two days later, I got pulled in. I was put on a charge of collaboration with Finn, of causing insanity to him, of *being* insane by association with him. Next thing I know, I'm here; the Valley of Mung Beans, chip-stripped and declared unstable. They said I needed tactile, low-tech rehabilitation. I was strung out, burnt out, washed up, feeling down, basically all *over* the place. That's why I had to be the newest member of the Shining Smile herbal commune. What trash! I'm the loose end, tied up.

Oh, it ain't a prison here, I'll admit that much. The hippies have welcomed me with open arms, me, the refugee from retina displays, come to be healed. God, I

can still remember my arrival. They made me the center of a large group hug that smelt of pachouli oil, old sweat and onions. It went on for *ages*. I started to worry that we were *never* going to separate and their uncombed hair and ragged beards would eventually stick to each others' hemp clothing like velcro and we'd become one big useless tumbleweed ball. What am I saying? I *am* stuck here forever! I *am* just one more useless, furry lump of agricultural weed. Please, I'm pleading with you, *I don't have that emotion any more!* You're safe! I'm not a threat. I can't spread that emotion even if I wanted to! I'm cured! I'm not mentally ill any more, I *like* buying pointless things!

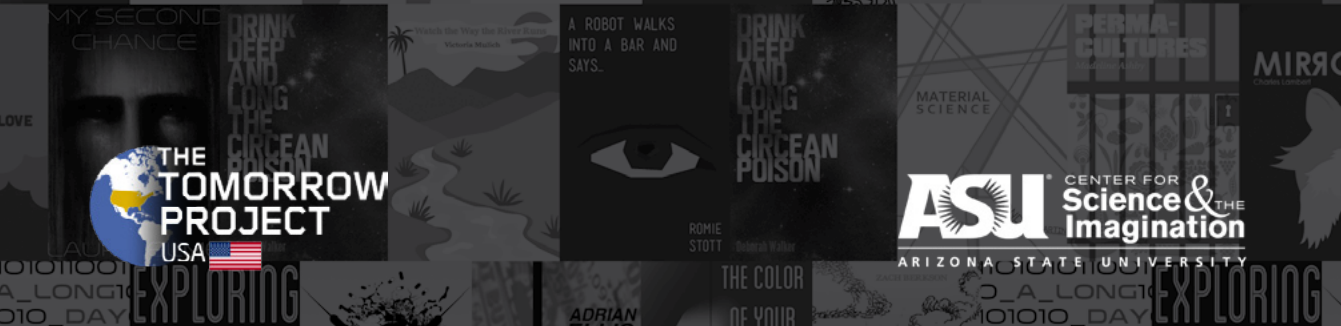
Help me!



MIRRORS

by Charles Lambert

© Charles Lambert



Soon after the baby dies, some new people move into the house next door. Jenny watches them from the bedroom window as they take down the Sold sign from the front garden. She's about Jenny's age, with her hair tied back, wearing jeans and a tee-shirt. She's laughing as she pretends to smash the sign to bits, lifting it above her head like an axe. The man steps back, throwing his hands into the air, in mock terror. He's skinny, with a studious look about him; he might be a scientist or, more likely, a science teacher. She watches them go inside the house, then sits down on the bed, pulling her dressing gown around her.

The house had belonged to a Scottish widow. Roy joked about asking her for a good insurance deal, but Jenny had to have the joke explained so it hadn't worked. The widow had begun to fall over, so her children had her moved into a care home and put the house on the market. Jenny had been two months gone when the woman was taken away, but they hadn't been friends so she hadn't thought much about it, apart from the sense of hollowness the empty house gave her when she was lying in bed some nights, when Roy was away. It was like one side of a mirror, she thought, her bedroom and its reflection in the other house, where the widow used to sleep, except that mirrors only ever really had one side.

Roy's work takes him away more often than she likes. He installs computer networks in offices, factories, hotels. She doesn't really understand why he needs to be away so much, but trusts him with her heart. When she told him she was pregnant and they'd decided to use the small back bedroom as a nursery,

he'd put in a baby monitor and linked it up wi-fi to her laptop. So you can see what's going on while you're working, he'd said. He'd set it as a screensaver, a screensaver with sound and movement, like an open window from one room to the next. Before the baby was born, she'd found herself not working deliberately, to see the room appear, the cot with the teddy-bear mobile, the table beside it for nappy-changing. She'd watch the light move over the bedspread towards the pillow.

Then, when Susie was born, she kept her with her, beside her as she worked, or tried to work, and hardly had time to wait for the image of the nursery to appear. What would have been the point, in any case, of staring at an empty room? With Susie, there was never time for anything; she had never felt busier or happier in her life.

She was standing with Susie at the nursery window one afternoon, rocking her in her arms, and she saw, to her joy, a fox run across their garden into their neighbours', like a blaze of red against the deep moist green of the lawn. A fox! she whispered into Susie's ear and Susie seemed to know that something miraculous had happened from the way her face lit up. A moment later, before Jenny had had time to absorb what she'd seen, the fox darted back across the garden with her cub behind it, smaller and brighter than its mother, and Jenny's eyes filled up at the wonder of them both. A fox and its cub, she said. We're so lucky, she whispered again, squeezing Susie to her.

The new couple move in towards the end of the summer. They've spent the last three months ripping out what the house contained and heaving it into a skip. Jenny has stood for hours by the window of the back bedroom, where she's made her office, and watched the man carry door frames and skirting boards out into the garden to stack on the concrete slabs of the patio. The Scottish widow

spent most of her time in the garden, dividing it into a clutter of flower beds and cell-sized patches of lawn, low walls with statuettes of rabbits and frogs perched neatly along their tops, a bird bath that hasn't seen water, apart from rainwater, since she left. The man doesn't seem to care much about gardens, laying the skirting board down across plants to rip out nails with a claw hammer. He hasn't got much idea, Jenny can see that at once. One afternoon he cut his hand on a twist of wire that must have been something in the kitchen. She heard him yell out and jumped back from the glass, as if she'd been seen. He stood there, staring at the blood, for what felt like ages. She'd have opened the window and said something in the end, if he hadn't gone back inside.

She hears the sound of a child the first night they're in the house, a running and a crying out as if someone has been slapped. She takes the remote control out of Roy's hand and turns the sound off, but he doesn't wake up. She sits there, holding her breath, listening for the child again, but all she can hear is the noise of the programme that she and Roy are watching coming back at her through the wall from the neighbours' TV. It's something about a girl born with a mermaid's tail, she's on the brink of tears just looking at it now, the sound on mute, the girl in the water, her natural element, except that it isn't, she's a girl like any other girl, apart from her legs. She's no more a mermaid than Jenny is.

She tells Roy what she heard when they're getting into bed. He's sitting there with his socks on, and nothing else, and she seems to be seeing him for the first time in ages; he's whiter and softer than she remembers. Her heart jumps with love for him, and a sort of pain she can't fathom, as if she's hurt him somehow and can't put it right. You ought to go round and say hello to them, he tells her. See who's there, exactly. It's funny though we haven't seen any children this summer, with all their coming and going, he says, peeling off his socks and holding them in his

hand for a moment before tossing them into the corner of the room. But Jenny doesn't answer. She's thinking of Susie, how one day she was there beside her, coiled like a sweet plump spring with her own mysterious energy, making sounds that Jenny had almost convinced herself were on the brink of becoming words, were words of love to the only mother she would ever have; the next day, her limp stripped body was being examined by the social services for signs of abuse, and Roy was holding her, at first for comfort and then to keep her from hitting out. They have to do it, he said. It's their job.

Now she says, with Roy already in bed, the duvet pulled up to his ears, I heard her crying, I'm sure I did.

He took the camera out of the nursery after Susie died, but he needn't have bothered; she wasn't in any mood to work. She was freelance, no one cared what she did. She'd go into her office, and turn the laptop on, then wander round the house until she was tired enough to watch TV. Sometimes, sitting with the remote control in her hand as people she didn't know looked at houses and sold antiques, she wondered what the woman moving in next door did with her time.

Days pass and she doesn't hear the child again. The house next door is so quiet she wonders if they've gone away. From the bottom of her garden she looks up at their windows, but can barely see beyond the drawn-back curtains. A mobile of some kind is hanging just inside the smaller room, but she can't make it out; it might not even be a mobile but something else, some kind of gym apparatus perhaps. If there were anyone inside the rooms, standing back from the window, they'd see her, half-concealed by an apple tree that hangs over from their garden into hers. Reaching up, she plucks a russet from one of the lower branches, feeling like a naughty child. She'd like to be caught.

She's climbing the stairs with the apple in her hand when she hears crying again, not the kind Susie made during the night, but a whimpering, a whingeing almost. It doesn't sound like a girl this time, but a boy, a small boy who's hurt himself but doesn't want anyone to know. She stands there, not breathing, her head to one side as she tries to work out the source of the sound. It's in her own house, upstairs, she's sure of it. She glances at the door of what used to be the nursery, a few feet up to her right, then feels her legs give way beneath her. The whimpering has stopped now. Grizzling, that's what *her* mother would have called the sound. The grizzling of a child only feet away from her, in her own house. If it's not in the nursery, please God, it must be in one of the other rooms.

She stands up and goes into the back bedroom. The computer's on energy-saving. She clicks the mouse - she's come upstairs to work - then crosses to the window and glances down into the next-door garden. The woman is hanging out washing on the line; she doesn't know she's being watched. Jenny looks for something a toddler might wear but everything belongs to adults, shirts, tee-shirts, underwear, the sort of clothes she herself might hang out. She's trying to forget what she heard, pretend it never happened. She's worried she might be going mad like some woman in a nineteenth century novel; mad with grief.

The neighbours have some people round that evening. Roy tells her, if she's so interested she ought to introduce herself and Jenny, embarrassed, moves away from the window and draws the curtains closed. They're having curries, Roy's ordered them in from the new Punjabi place down the road. When the bell rings, she takes the carrier and just has time before she closes the door to see a couple with a little girl walk over from their car into the next-door's porch. The girl must be six or seven years old. She's tugging at her mother's hand as if she doesn't want to go in, saying something Jenny doesn't catch; but her mother takes no notice.

I'd never do that, Jenny thinks. I'd listen. Why have children if you don't listen? She hasn't told Roy what she thinks she might have heard. Next day, after Roy has gone out, she sees the two of them walking to the end of their garden with some device made of metal and wire, something that looks like a trap, and leave it beneath a pile of leaves on the far side from her hedge.

That night, alone in bed, she hears the fox bark. Roy's away for a few days, installing a security system in a hotel. He called her after dinner, trying to make her laugh with some tale about people being filmed having sex in a lift; there's no escape from the all-seeing eye, he'd said, and she'd laughed although it hadn't seemed funny. It had seemed cruel. She didn't tell him about the woman; it had slipped from her mind. She'll tell him when he's home.

The fox barks again, an anguished, nerve-scraping bark that sets her teeth on edge. The other times she's heard it, it's been followed by the higher-pitched bark of the cub. Tonight though, there's only silence. She thinks about what she saw her neighbours placing in the garden. Was it really a trap? What kind of people would do that, she wonders. To her surprise, she starts to cry.

Jenny's at the supermarket a few days later when someone behind her says Hello. She turns and sees her neighbour. I thought it's about time we met, the woman says, head to one side, with a challenging smile that makes Jenny uneasy, as though the fault were hers. She holds out her hand and the woman, after looking at it for a moment, takes it in hers and holds it. She's sizing me up, thinks Jenny. They're the same height and both wearing jeans and jumpers; they both have the same fair shoulder-length hair. They could be sisters. Come round some time, Jenny says, and the woman nods. I'd like that, she says, finally letting go of Jenny's hand and pushing her trolley off towards the tills. Then, as if she's just remembered, she turns her head and says, with the same unnerving smile, Oh,

yes, take all the apples you want. It's fine. We don't really like them. Outside the supermarket Jenny realises the woman hasn't said her name or asked Jenny hers. She stands on the pavement looking round, but the woman's gone.

Jenny's gazing out to rest her eyes from her work when she sees the fox at the far end of their garden, beneath the poplars, in a part they've allowed to grow wild. There's no sign of the cub. It's snuffling around in the carpet of rotting bluebells and fallen leaves when something makes it lift its head. She's about to cross to the window when the spreadsheet she's been working on all morning disappears from the screen and there's a kind of static, the kind televisions used to have when the vertical hold went awry and people would slap the set top with their hand to put it right. It settles down and she sees Susie's nursery. That can't be what it is, she thinks, Roy's turned the camera off, but she sits down heavily on the chair, half-falling, and looks at the screen as the image seems to settle. It is, and isn't, the nursery; it's the nursery seen through a mirror, with the cot taken out and the mobile and the changing table removed; the nursery reversed and bare. And then, with the same shudder of static that preceded it, it's gone again.

Roy's at work so he can't talk for long. He tells her to calm down, he'll take a look when he gets home. These things happen, he says, it's all to do with frequency, waves, sensitivity. It's a software problem, he'll put it right. He loves her, he says. I know you do, she says, but I wish you were here. I miss you so much. If only the woman next door were a friend, she'd go and talk to her. She turns the computer off and sits at her desk, too shaken to move. There's no sign of the fox.

She goes to the top of the garden later that afternoon, when it's almost dark, and peers over to where the trap, if that's what it is, has been laid. All she can see is the pile of leaves, holly leaves mostly, and brambles, but that means nothing. It

might have been triggered and re-set since the cub was taken. They might have done anything at all.

Two days later, with unfinished work called in, Jenny decides she's being foolish. Roy's due back that evening, which gives her strength. She goes up to her room, but before going in, as if to test her nerve, she opens the door to the nursery. She's hardly been in here since Susie died. Roy's moved the cot to one side of the room but otherwise it's as she left it. She touches the mobile and watches the teddy-bears swivel, then stills their movement with her hand before crossing to the window. She feels that the last few months she's done nothing but stare out, as though her life were somewhere outside her and she was nothing but its reflection. As though she was being lived by someone else. And then the man comes out and looks up at her window as he walks across the lawn, and she steps back quickly although she knows she can't be seen, all he will see is darkness. She steps back and waits as he nods, as if to her, and pins out a cloth the size of a nappy on the line.

Five minutes later, she turns on the laptop, and waits for it to boot up, then opens the spreadsheet and sits back, her arms crossed, while some invisible clock decides how long it will be before the room comes back to haunt her. Almost too tense to bear it, she's reaching out for the mouse, but her hand stops when she hears a noise, a sort of grizzling, and the lines on the screen form an image that almost but doesn't quite make sense. It looks like a naked child on a bare wooden floor, its arms tied behind its back. As soon as she's seen it, it's gone, dissolved into jagged lines, and she's shaking with horror. She watches the picture reform and with it the noise of the child as it turns its head, as if seeking out a source of light. There's something that looks like duct tape over its eyes, but it seems to know where she is, because it turns its head and, of course, it's a boy, she can see

that now, it isn't an it, but a he. She runs from the room in a panic. She stands on the landing, trying to calm her breathing and doesn't see the woman, who could be her sister, come into the other room, only thirty feet away from where she is standing. She doesn't see her turn to the camera to grin and wave, before pulling the bound and blindfolded child to his feet.

EXPLORING TOMORROWS THROUGH SCIENCE FICTION



The following three stories came out of the idea of virtual intelligence and how we might integrate it into our lives without it replacing or supplanting us. “Racing VI” in particular speaks to a very real worry of mine, perhaps childish, that I won’t be allowed to drive anymore. With Google’s fully automated car, it isn’t all that far-fetched an idea, though perhaps a few years off. Driving, while a mundane necessity for many, is an enjoyable and defining experience for me, and I wanted to see how we might simultaneously make things more safe through technology but also maintain the life experience that is driving. As a Cadet at the US Air Force Academy, the technologies that are going to affect the warfighter and what impacts they will have are very important to me. The story “Thank You MARTHA” stems out of that interest and attempts to draw delineations between where technology helps good behaviors and where it enables poor behaviors. As an augmented reality piece of equipment as well as a virtual intelligence designed to augment the warfighter himself, MARTHA, is an idea in synergistic relationship between man and machine and some of the positives and negatives thereof. Finally, “No Thank You Alfred” stands as a piece simply evaluating just how real robotics and AI could become and the opportunities they might have to comment on human experiences. It is a literary trope for the pariah, the outsider, to have insight that the regular person does not. It is likely, especially with the fear and trepidations surrounding AI,

Introduction: Exploring Tomorrows Through Science Fiction
David Michael Jorgenson

that a truly intelligent artificial being might be capable of this kind of perceptive insight by virtue of its objective external view on human interaction.

The characters in these stories and some of the tensions come straight from my own life experience; also, while the technology intrigues me, it is the effect on people that actually matters. What good is technology without the human considerations? I would contest that there exists none at all, but don't take my word for it. I hope you read these stories critically and think about things that I may not even have meant to put in. Apply them to your own life and circumstances, and then join the conversation. If they teach you a lesson, wonderful, it is yours, and if not, gloss over them and find inspiration and insight elsewhere.

Overall technology is advancing, and computers are becoming smarter and more aware. I think it is extremely important that we begin contemplating the ramifications of such leaps in artificial intelligence, and decide how best to deal with those issues as well as how to capitalize on the strengths. The specific technologies that inspired these stories and some of the interesting AI characters are Apple's Siri and the continuing work on context awareness by people like Lama Nachman at Intel. Making our computers aware, and giving them personality brings a comfort with it, but perhaps there are dangers as well. Narrative provides us a tool to highlight some of these questions in a way that allows the reader to draw their own conclusions, which is exactly what I hope you will do.

David Michael Jorgenson
Cadet First Class at the United States Air Force Academy, Intel Labs Intern

EXPLORING TOMORROWS THROUGH SCIENCE FICTION

HACKING HUMANITY

by David Michael Jorgenson

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ARIZONA STATE UNIVERSITY

“Go ahead, detective, she’s ready to talk.” The patrol officer’s voice played like a bad recording in the back of my mind as I opened the door on a grisly scene. A body lay in a pool of blood, cut marks covered the entire corpse, and his guts were spilled over the floor of the 2nd floor hotel room, a short Japanese blade lay bare and bloody on the floor underneath him. The room was more of a hovel really, but I suppose that doesn’t sound so good in the ads. The faux-wood floors were chipped and cracked and dust, cobwebs, and piles of mouse droppings filled the tiny 10x10 space. A little twin bed was shoved up into the corner trying to gain as much space as possible and a single nightstand, barely large enough to hold a simple book, stood next to it. The scent hit me like a Mack truck driving straight up my nostrils and into my brain and from there, bearing down the highway to my stomach and exploding in a violent crash. I fought back the desire to hurl, but to no avail as acid and bile filled my mouth. I choked it back down and moved in, keeping my cool even though I wanted nothing more than to sprint out of that damn space and breath the pseudo-fresh air outside. The others covered their noses with handkerchiefs and coat sleeves, but I had to be strong. This wasn’t my first time with a corpse... it wouldn’t be my last.

Death’s power hung heavily over the room, not just in stench but in aura. I’m not a superstitious man, but there is something about the place where a man has died, something that haunts you, leaves you cold inside. The more gruesome the

death the heavier the mark it leaves. The worse the stench, the colder you feel, and that day I felt frigid, like a bitter, biting rime had encased my heart and was pumping liquid nitrogen instead of blood through my frosted veins. It didn't help that it was Monday, and I was getting too old for this shit.

I strolled over to the body, dodging rat traps and ducking spider webs as I pulled out my handy sensor kit. Used to be a coroner would meet me, but those were the good old days, back when I first started. Not anymore. I had everything I needed in this handy little kit. Finger prints, dental records, direct DNA sequencing; I could do it all and more. Half the time I couldn't work the damn thing, but my virtual assistant guided me through it all. I don't think I'll ever get used to that nagging voice coming into my ear and all the junk scrolling across my eyeball, but I suppose that's just how it goes. All the detectives are required to have the implants unless you can prove that you do better without the help. I nearly proved it once, nearly.

As I let the little gadget work its magic to give me a cause of death and I.D. on the vic, I set to looking about, picking through an old, worn suitcase carefully combing for clues. By all accounts it looked like a suicide, but something just didn't feel right. When you've done this long enough you learn to start listening to your gut. Sure you can't use it in a courtroom, but on the streets it's invaluable. Something there stunk more than the spilled large intestines of the very unfortunate man, God rest him.

"Ahem!" The loud throat clearing came from nowhere in particular, as if it were the voice of the Almighty Himself simultaneously coming from every possible direction. I stood up slowly, not responding in the least despite my surprise.

"Detective, would you like to talk to me yet? I believe I can clear everything up." The voice's origin was an old smartphone with pretty good speakers, it was

lying on the ground and managed to fill the tiny room with the VA's voice. A lot of people have 'em. They learn you like nobody else because they live with you, watching, studying, and helping. They were programmed to understand the human they worked for. It sounds all very big brother, and maybe it is, but people can get pretty attached to the darn things, and they do make life easier, mostly.

"Isn't clearing your throat a little out of place for a computer?" I wasn't in the mood for theatrics. "Let's get this over with. What did you see, bitgirl?" They always hate that, at least they respond like they hate it. I am still not sure if they actually feel anything at all, but they sure seem like it sometimes.

"My name is Laura, Detective, and I am your only witness." The VA responded feigning anger I think, "I managed to save myself when he died by uploading to his old smartphone. Honestly, I'm not sure why he still has it. I am sorry to disappoint you though," the voice intonation changed to one of sorrow, choked up as if fighting back tears... tears that it couldn't cry. The VA muttered, "He killed himself. I watched through his own eyes as he cut himself over and over, just little cuts. After each he cried out, but he didn't stop. His vital signs showed clear signs of stress. And then he paused briefly before picking up the tanto again. He kneeled and drew the blade from its sheathe slowly, his heart was racing so fast it was pounding even in my own sensors and distorting things, and he stabbed into his own stomach." The speakers erupted with thunder as if from a massive storm. Expressing emotion through sound files was a favorite method of the Virtual Assistants, but sometimes it didn't quite seem to fit. That was one of those times. "He, just kept cutting, in agony, and then he put the blade to his own throat... and it was over."

I was still a little staggered by the scent, but I had the wherewithal to ask for a copy of the video from the VA since she certainly got it. What he saw before

his death, she had seen as well. Damn did they make my job easy! Pretty soon I wouldn't have one anymore, but I suppose that's ok. Who needs detectives when almost every object in any room might have a computer program running on it constantly, like an extra person, extra eyes and ears? Hiding in the world of today is nigh impossible, committing crimes without getting seen by someone or something, even more so. The victim's own VA could replace the testimony of the victim themselves having seen and heard it all, unless you were to sever the VA as well, and that required minor surgery to do properly. And I remember the days when people got all up in arms about privacy... Privacy? What a joke.

Despite my gut feeling, all the evidence pointed to suicide. Some younger detective, only on the job a few weeks told me it was something called Seppuku; a ritual suicide practiced in Japan in the feudal era by the Samurai whenever they lost their honor. That didn't add up well either. The data came back on our vic, a 34 year old male of mixed European descent, primarily Norwegian, named Sven Oilersen. Thing is, he was wealthy, I mean seriously minted. He owned two castles in Switzerland. Yeah, I said *castles*. What was he doing in a ratty motel in the middle of nowhere on the outskirts of L.A.? That's a damn good question. I'm still wondering. We finished up at the scene, using an infrared laser to trace out the entire area so that it could be digitized and recreated in a 3D virtual environment for later review and permanent filing.



Back at the precinct, Boss told me the case was closed. "Go Home, detective," he said, writing me off. "It's nothing more than a suicide." Home? I don't have a home anymore, never did. All my family has passed, and I never had a wife. I live in a single apartment. It's a place to sleep but it ain't no home. Besides, I'm old. I

can feel it in my bones that this might be the last case I work on before I head out. Retirement might as well be death for me. So I hung on to one thought from the days before I got so damn cynical, by Tennyson, “Death closes all; but something ere the end, some work of noble note may yet be done, not unbecoming men who strove with gods.” Some work of noble note. If I am being forced out, I better go out with a bang, solving a real case, and this one was just too strange to pass up. So as I headed out, I stopped off in evidence and copied the video file and brought it “home” with me to do some more research and collect my thoughts. I also put on hold for a copy of the fully digital layout of the crime scene.



The video seemed pretty clean cut. It was difficult to watch the first time, but by the seventh I was thoroughly depressed. It contained nothing to go off. It’s so senseless for a man to take his own life... I had a buddy back in the army who hung himself. Nasty business, that. Always wondered if there was something I coulda done, if maybe it was my fault. I know now that was ridiculous; he made his own choices. No man can take responsibility for another man’s actions or blame himself for their mistakes, didn’t stop me from trying though. Still doesn’t stop me still. Funny how easily I can get taken right back there, right back to the day I heard he had died, and wonder all over again if I was to blame. As clean and pristine as the video was it just seemed; off. I can’t think of another word to put there. Used to be I was pretty good with words, not anymore I guess. Either way it seemed wrong, just plain wrong.

“Do ya notice anything strange about it, Watson?” I named my VA Watson after Sherlock Holmes’ faithful sidekick. I realize now that it was a bit pompous to do that, putting myself on a level with the great mythological master of all

detectives, but I just thought I was being clever. Watson's voice came through, "There are some anomalies in the video file itself, Sir."

"Anomalies? Watson, be more specific. Did somebody mess with the file or is it just wonky, glitchy coding? How do you call it, corrupted?" I was always a bit terse with Watson. Maybe I shoulda been nicer, but he was just a machine, right?

"Analyzing."

I went over to talk with my good friend Morgan in the meantime. He was a captain, very important man. It only took Watson a couple minutes, just long enough for me to get comfortable in my favorite old chair and start on a couple fingers worth of rum.

"I have no doubt, Sir, this file has been tampered with. But it seems like it was corruption within the VA itself."

I leaned back into my chair, coddling my drink like something precious and started to think. "Can you access that VA, what was it Laura? Can you gain access to her software and see if anything else has been compromised?"

"Certainly, Sir!"

I paused for a moment, a thought popping into my head. "And Watson," my voice was tense and he caught on pretty quickly

"I understand, Sir. I will be discrete."

Compromised tech normally only had a few possibilities. It was faulty to begin with, the beginnings of artificial intelligence, or it was hacked. From all directions it seemed like Laura was fully functional and working with Sven for a very long time. I didn't even want to think about the possibility of a rogue AI. Despite all the movies that made it seem cliché that was a truly terrifying

concept. No, this was probably a hacker. Someone wanted Sven dead, but why and, perhaps more importantly, how? I needed to head down to the morgue, I had a hunch.



“How can I help you this beautiful day, Detective?” The robo-coroner’s upbeat tone was supposed to help people cope with the seriousness of the death that surrounded the morgue. It didn’t help. It just made the bot seem callous and rather sadistic. Not a good way to build trust with technology advancing so quickly.

“I’m curious what kind of implants our suicide from earlier had. Sven Oilersen was his name.”

“Yes, detective. May I ask why you need to know?”

That was a cheeky question coming from a robot. I’d never heard one ask why before, and it seemed a bit odd to me. I had a hunch there was something else going on here, but I couldn’t give away my play if there really was a hacker on the other end of those two hi-def cameras that the bot had for eyes.

“I did some research and found out that the guy was really wealthy and into the whole augment scene. I’m just a detective, but I have always wished I could afford some more augments. Dammit, it’s stupid I will just get out of here.” I didn’t know if that would work. It was a bonehead bluff, I knew. Besides, what old codger wanted augments really? Maybe that was over the top. Not me, that’s for damn sure. Besides, I don’t think my old bones could take the operations necessary.

“Of course, detective, who wouldn’t want to be more than human?” The robot’s voice seemed very strange saying that, and held a deep sense of foreboding. The tone and the plastered smile on its face did not make it more likeable, but instead made it appear psychotic and unstable. I remember praying, praying it really was a hacker and not some crazy, human-hating AI. I shook off the fear as the robot started heading down the rows of refrigerators, “This way, detective.” He stopped about half way down the corridor and pulled open one of the doors, dragging out the slab that held Oilersen’s body.

There is such a difference between a man and his body. You see as much death as I’ve seen and you’ll know it clear as day. There is nothing of the man in the body when it dies. I swear to it. I’ve seen friend after friend, and family members go in all my years. Each one, when they pass, you know that the body lying in the coffin just isn’t them. It’s empty. Call it a shell or whatever you want, but to me it’s just a sack of skin that contains something more important. Soul, spirit, essence, whatever you want to name it, I just say that the man isn’t in his flesh at all; not even the synapses of his brain. All that stuff is still there at death, but the person, he’s just gone. Maybe I am getting too soft. Getting old makes you think a lot about dying.

“The man had extensive augmentation done, detective. I found nanotechnology sewn throughout the muscles of chest and his arms as well as synthetic metals bonded to his skeleton especially at the contact points like the knuckles and elbows.” The robot’s voice was candid. “I would have reported it, detective, but since it was deemed a suicide at the scene my protocols simply state to record the findings and publish them to the database.”

“Of course. It’s not a bother. I was just curious and had a little time on my hands. Boss sent me home early.” I kept up the façade, still not sure whether this bot might have been remotely accessed.

Human augmentation was extremely expensive, but not unheard of. Underground fights between augmented combatants were just starting to get popular. Ultimate fighting taken to the next level, but the fights themselves weren’t widespread yet. The fighters themselves tended to be billionaire playboys from around the world. The aristocracy, if the term fits. It was all just an extra excuse to get enhanced and beat someone up, but the public loved the “return of chivalry.” Fighters challenged each other for all sorts of reasons, calling into account their opponents for imagined slights against their family honor. It was a strange mix of classic Victorian duels, brutal mixed martial arts, and the pomp and absurdity of the old WWE. Sven Oilersen fit the profile, though his augmentations were considerably less flashy than many of the others in the leagues.



I started heading back to my house, all my hunches coming together to jive with the evidence. Now I just needed Watson to get me some information on that hacker. Damn if this wasn’t going to shake up the precinct. Some work of noble note indeed; if I could catch the prick. Watson’s voice came through my ear in a hushed tone, as if someone else was listening in on my own auditory nerve. “I found him, Sir, I found the hacker. I managed to trace a breach in Oilersen’s VA’s firewalling. This hacker is either very good, or very well equipped to break those encryptions. There is only one break in the hardwired connection between a VA and a man’s augments and this guy managed to get through it. I had to

back trace him half way across the globe. He was quick, and very skilled, Sir. He almost deleted me entirely as soon as I got back to him, but I got the address. It's actually here in L.A. Who knows what you will find there, Sir, but I suggest calling for back up."

"Good work, Watson." I said, "Can you gather all the necessary information we've gathered thus far and send it up to the Captain? Tell him the Oilersen case is a homicide, and I am following up on a lead." I had programmed Watson to "disappear" entirely whenever I sent him to run errands. It made him seem more like a helper and friend as opposed to a constant nuisance I could never escape. It was a little thing, but it helped me cope with my lack of personal time. I headed out to the address, a corner apartment and little more.



I just wanted some glory, to go out with a bang, catching the first murderer who had killed from his computer screen, making it look like a suicide by hacking the man's VA and then his augments. Sven had killed himself, his own arms reacting to commands sent by the hacker through the compromised VA. It was almost the perfect murder, but my intuition got in the killer's way. I felt I was striving with the gods once more. I felt alive. Now I am laying on the floor, in a growing pool of my own blood and filth, a .45 caliber bullet burning in my gut. Watson's connection to me has been severed, and I don't know if anyone's coming. I did my part though. I gave them a lead and a picture of his face just before he shot me. The rest is up to them. I don't feel so hot. Never thought I'd actually use this old recorder for anything, but I wanted to tell the story. I wanted to mean something before the end. I guess I really was too old for this shit...



“Ready,” The command was harsh, “Fire!” Seven guns fired over the crowd of grieving policemen. “Fire!” again, the guns’ report drowned out the sounds of heroic tears. “Fire!” A 21 gun salute was given over the funeral of Detective Alfred G. Frank as all the city’s cops gathered to honor him. His killer could hear the shots from his jail cell at the old Iron Hotel.



As for me, the body they mourn is not me.

I have gone.

Where to? I cannot say;

Words beyond the grave are but few

And the boatman binds my tongue.

Can anyone hear me, I wonder?

No matter.

Drink deep of life my friends,

Straight down to the dregs.

Drink deep and mourn me not.

EXPLORING TOMORROWS THROUGH SCIENCE FICTION

THANK YOU, MARTHA

by David Michael Jorgenson

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ARIZONA STATE UNIVERSITY

The rifle muzzle peeked out around the corner of the ramshackle building. As Private Winstead's shoulder followed, a barrage of gunfire erupted from a section of rubble some 50 yards away, and he retreated back behind the stone wall. As he breathed a sigh of relief, the all-knowing voice entered his head again: "Calm down, private, we will get through this together. When you peeked me around the corner I saw three targets, easy visual. The gunfire came from four spots though, I ran an algorithm to figure out where the fourth shooter is, and I can guide you to him. My targeting is up on your optic, just slow and steady, private, slow and steady."

The private breathed deeply again as sweat poured down his face, and he dropped down onto his belly. Keeping most of his body behind the wall, he peeked out just enough to get the muzzle past the stone and to get his optic up in the area. As he rounded the corner slowly, three bright red outlines came into view. *Slow and steady, slow and steady*, he thought to himself as he squeezed off the first shot. The target dropped and another round of fire sprayed around him, but his low profile made him a very hard target. He squeezed off a second shot dropping the next target and the shooting stopped. The third target had stopped, but the private pulled off another precise shot and dropped it as well. *The fourth, where is the fourth?* he thought as he took a knee then continued around the corner to survey the area. The co-witnessing optics allowed him to

use his regular sights if something went wrong, but he relied most on MARTHA (Military Advanced Reconnaissance and Targeting: Human-Assisted).

She was his constant companion through the firefights. Her job was to run complex data analysis and trajectories on the fly, and provide easy target discrimination constantly throughout patrols. As both a weapon-mounted optic and an ocular implant, MARTHA could stream constant data about the soldier's surroundings and help with targeting, but it was still up to the soldier to make the final decision to pull the trigger. She was a marvel, but just a machine. She had no blood and guts and conscience to deal with. MARTHA's steady voice came through again as an area within the optic was shaded red with a large X over the most likely area for the final shooter. "First three hostiles confirmed down, fourth possible is most likely there at the X," MARTHA said. "Scanning 360 degrees for other possible threats. Good shooting, private!" The compliment sounded hollow, as if killing a man is as simple as a good shot. He knew better, but the machine wouldn't understand that, didn't need to.

"Thanks, MARTHA," the private said with a tone of sarcasm as he approached the area taking cover behind a concrete section of a bombed out building. He drew a bead on the X and took the slack out of the trigger. He took a deep breath and started to press. All he had to go off of was the X on his optic. He had no clear visual and could see only a darkened haze beneath an angled piece of fallen concrete. "No," he said calmly as he released the trigger and looked up. It wasn't right, he knew, to just fire at the X, though many would have. A machine would have, it was the calculated action, but he had to know for certain. He sprinted for a piece of cover and slowly made his way through the rubble keeping vigilant with his own eyes not fully trusting MARTHA to pick up his slack though she rarely missed anything at all.

He stepped over a possible trip wire, moving past everything carefully. Who knew what it actually was, but it wasn't worth the risk, not ever. In his first deployment the private had seen his captain get his legs blown off by an IED. The private didn't think before he leapt into the enemy fire and dragged the captain out, saving his life and earning a bronze star with a V for valor and a Purple Heart for taking a shot to his right shoulder in the process. He had plenty of time to think since the incident, and all he remembered is the bloody stumps, the dirt, the dust, the ringing in his ears, and the jolt, like a sledgehammer, that smote his shoulder while he kept dragging the half-conscious body of not only a leader, but a friend, toward the safety of some cover. He remembered his own weakening sobs, and wondering if any of his unit would make it out alive. Every time he raised his weapon, he remembered that day as the pain shot through his right arm, but it was a dull pain, just enough to remind him to move thoughtfully. It had earned him his choice of assignment, and that's how he ended up working with MARTHA.

MARTHA continued giving updates as he made his way through the rubble to the X, mostly "all clears" and tertiary warnings about possible IEDs and other things in the vicinity too far out for him to worry about. He approached the X cautiously with his weapon raised, ready to do violence if necessary, when MARTHA's voice shrieked in his earpiece: "Cease fire! Child! Unarmed!" He didn't need the message—he saw clearly that the target was a ballistics gel torso of a young boy, an expensive target used to test how bullets actually affect human tissue on impact. It was wearing a baseball cap and laying prone. A gun was sitting some 10 feet away from him, representing that the boy had fired but appeared to have lain down his arms after the initial assault. *MARTHA's calculations were spot on for where the target would be; X marked the spot.*

His thoughts were interrupted by a loud siren, and the earpiece now acted as a direct line to his commander. “Great job, private. A few more tests like this and MARTHA will be ready for deployment. You cleared a full team engagement scenario, just you and her, and not one mistake. Your sergeant was right when he said you were a sharp kid, and I’ll be damned if those engineers won’t be happy to see how well man and machine can work together. Head to the exit and gear down; we have to debrief you. Great job again, private, great job.”

More hollow compliments the private thought as he proceeded to the exit and began to strip off his gear. *Full team engagement scenario, HA, engagement scenario my ass. Life or death, I’da shot the X.*

TOMORROW PROJECT BRAZIL



ARIZONA STATE UNIVERSITY

Since the dawn of Humanity, men have been using their imaginations to transform and improve their environment, with the intention of advancing their quality of life and the human condition. Thanks to their geniality and ability to execute, they conquered great technological, scientific, and social progress that has boosted the advancement of many different civilizations.

The wheel, the compass, the steam engine, the lamp—fantastic inventions that revolutionized and radically transformed our world. But, how fast? How long did it take? And what's their reach?

Internet, mobility, Cloud, connectivity, super processors... Technology. Tomorrow was never this close, and, even better, it was never this close to everyone.

We are living in an era in which technology has exponentially reduced the distance between individuals, socialized the resources, and increased transparency, ethics and commitment. These are new times, when each one of us has super powers in our minds and at the tip of our fingers.

Here at Fiap, we are convinced that a youthful way of thinking, creativity, boldness and technology are the paths to increasing improvement.

As a Technology University, we put together the efforts of students, professors, researchers, executives, and partners in order to harness all the energy generated in our classes, to effectively benefit society.

Introduction: Tomorrow Project Brazil
Gustavo Gennari

That's why we were happy to support and to become partners of The Tomorrow Project initiative in Brazil, because we believe that it offers an invaluable path to stimulate the human imagination and possible futures of technology.

Everything that was created till these days was conceived by individuals and everything still to be created will be conceived by individuals. The stories gathered in this anthology give us a glimpse of possible scenarios for our future limited only by our own imagination. Therefore, tighten your seatbelts and be part of this journey: The Tomorrow Project.

Gustavo Gennari
CEO, FIAP University

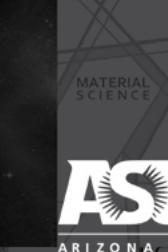
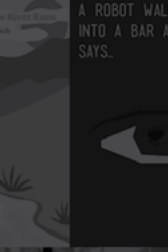
These stories were written and submitted in Portuguese. Please visit <http://br.tomorrow-projects.com> to view the stories in their original language.



FILL

by Paula Gomes

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ARIZONA STATE UNIVERSITY

He sat down while finishing charging his leg. Fifteen minutes every four hours. He had to do this at least three times a day. Three breaks for thinking. However, in most of them he would just sit and stare at the void, occasionally peeking at those passing by till he attracted somebody's attention. Then, he would look the other way, afraid of getting undesirable company.

That afternoon, he still had six deliveries pending. Two of them were at the Nest. He was going to focus on that now, while there was still daylight. Volkz promised that he wouldn't accept any more deliveries to that area, but, in the last few weeks, trips there were not phased down. He had already lost a few parts there, but that place still didn't scare him. Somehow, he felt that he blended into that background.

The streets were empty at this time of day, but he knew that he was under intense scrutiny of eyes that hid behind the pod's windows. Linda lived there. She was one of the oldest in that neighborhood. She used to say, "We owned the first pods parked here. Their first generation. Very few could pay for one of them, and my father, who worked at the time at the Drugstores, was one of them. Later came other generations, and all this became scrap metal, unwelcome waste, a circuit cemetery." It was not exactly true, and she knew it. The place was shared with types so diverse that the urban landscape looked like a parade of anachronisms: It was the only place where you could see, walking side-by-side, *vets* and *nots*,

obsolescence and innovation. It was also strange to see some unique circuits, inspired jerry-rigging by the average Joe trying to increase his machine's longevity. They were so popular among artists that you could frequently see creators strolling in the neighborhood, looking for vestiges of creativity that might have survived these new times. It was still possible to find in that area any conceivable type of *specialties* that stood in the way of progress, dedicated to activities that could only be practiced in a place with such inattentive vigilance.

Linda almost never left the old pod, because the Nest became, in her eyes, sort of a parallel universe, or a very distant future where everything that she once knew was reduced to ruins. He nourished a certain anguish for that person trapped in her own past, but he couldn't do anything but bring her some *wuds*, when he could obtain any. It was the only refuge that she could find. Salvation thanks to a psychotropic trip within her own memories. The elders' drug.

He knew the address: He had been there other times. The same man always came to the door. A second generation engine, with damaged bottom circuits, kept on an improvised mobile platform. He lacked an eye, probably lost in an attack by metal scavengers. He was made with parts so ancient that the nostalgic would pay a fortune for them. He obviously new that. That is why he wouldn't keep his pod's door open for long. "Tell that damned Volkz that, if he doesn't send two of these packages next week, I will dismantle his whole fleet of deliverymen." Great, he just got involved in one more of Volkz's poorly patched businesses. He slid the leg he had just charged in the closing door to get some extra time. This would cost him a few circuits. "Could you tell me what is in the package? Because I have a few trustworthy suppliers myself..." He didn't have the habit of stealing Volkz's clients, but this time it was necessary, a matter of survival. That's what he told

himself on the way back, thinking on a way to obtain two kilos of *tera* till the following week.



Sometimes he would catch himself remembering that 2025 was his sixth year living in Nakkar. He had moved from North Korea against his will, in one of the last migration waves before the country's final embargo. Within a few days he had adapted to the new landscape like so many other immigrants, but he never really loved it.

The first thing he discovered about the new land was that after that moment, he would exhibit his identity on his own body. The second was that his identity was the one of an undesirable expatriate.

He also found out that the richest portion of the country referred to itself as the Pures, and, because they were submitted to surgeries to look different from other social groups, they ended up establishing a new aesthetic imperative valid not only in Nakkar, but in all New Asia: they were darkish, had Oriental eyes with grey pupils, plug ears, and slender bodies that could reach 2.5 meters. Fill was white, short, and, to his favor, he had only the almond shaped eyes. Of course, anybody could become a Pure, if capable of paying the price, the advertisement guaranteed. And that was the only thing Fill liked to hear.

A few years after their transfer, his father had died. He could never really breathe well in Nakkar, unlike him, who could fill his lungs, never satisfied. He felt a certain relief after his father departed. Now he could dedicate more time to his goal.

He began to work in the liquid market, producing different variations of symbiosis pills, to increase his client base. He made enough money with his inventions to buy mechanical legs - minimum requirement to work as a delivery man. The job was awful, but it had its advantages: guaranteed access to almost all the areas, restricted or not, in New Asia. He worked non-stop, motivated only by a mental image: the artificial Great Lakes of the Core, with its areal residential modules and subterranean parks.



He was in front of the Dead Zone's large wall. Despite what one could think, this region was not protected by high gates, and the walls were so degraded that they only offered a symbolic barrier to separate those inside from the outside world. The entry was guarded by a small security cabin with dark glass, in such way that it was impossible to know if there was effectively someone surveying who entered or left. He held his forearm to the sensor installed on the gate. Nothing happened.

He had bought this pass for 500 grams of Zantrax, subtracted from innumerable deliveries. He could only steal a few milligrams per package, an amount too insignificant for Volkz's clients to miss.

He knew that if the pass couldn't be read by the sensor, the zone's inspector would be there in 20 seconds. Even quicker, since that was the Dead Zone. He tried once again. The identifier hissed and then opened the gate.

He followed the path, always straight, walking fast. He couldn't give clues that he didn't know where he was going. It could be fatal. At the Dead Zone, everybody knew where they were going. He passed in front of a bar and couldn't resist staring at it for a few seconds. He never saw that, not even in the remotest areas

of the Nest. "Hey, boy!" Somebody at one of the tables shouted. He couldn't identify who that was, he could barely see through the night. He sped up his pace. He knew that, if he didn't find the place soon, it would be his end.



-Who is that?

-I came to have a reconstitution done.

-I don't do that.

-I know you do, and I can pay for it.

-How much do you have?

- 500 grams of Zantrex. And 500 grams of Blows.

The door opened with a click.

The place stank. He couldn't see almost anything and this calmed him down, because he wouldn't like to see what was producing that smell.

- I cannot give you any guarantees. Sometimes it doesn't work... Some get infections... Die.

-I know the risks.

He did not. He always chose to avoid that kind of information.



In the first few days he couldn't feel any member or muscle of his body. I must still be under the effect of the anesthesia, he thought. A few days later he got the confirmation: the paralysis was replaced by a striking pain that invariably

ended up in fainting spells. Nausea would wake him constantly, at unexpected moments. He didn't know if these symptoms were indication that he was recovering – or if he was dying. He couldn't see anything for five days. He considered the possibility of becoming blind forever. In that case, he would die. He didn't know where he was. Before the procedure, the “doctor” put in his pocket a key and told him that, in case he woke up, he could just open the room's door and leave. He also said he would come back in two weeks to bury him, in case of need. That was the agreement. This didn't scare him at that moment, but now it was different. He tried to refrain from those thoughts, forcing himself to dream about the future he planned for himself. But he dreamed for so long that the images began to fade, losing their color and even disappearing completely. It became pitch dark. One day, the door was opened. It was the doctor. He hadn't waited for two weeks; he needed the room. He had another patient. “Can you see my hand? No? It is not a problem, it is still too early, and maybe there is hope for you. But not here.” He abandoned him a few kilometers away from the Dead Zone. “You will have better chances of survival if you remain outside. I destroyed your pass. Don't ever come back.”



He couldn't estimate how long he laid inert in that road till he was found. A small familiar group of disposables that lived in a discarded pod-4 helped him. They took care of him for a few months - but the worst was still to come. His body had to fight against an aggressive infection that would cost him part of his vision.

When he could finally look at himself on the mirror, and joyfully recognize the image of a Pure, Marien, the beautiful daughter of the disposable couple, got pregnant. Fatalities kept repeating themselves with no respite, while he built

his way back to the Nest. When he arrived there, he almost never thought about these things. It was as if those concerns couldn't reach him at that distance. In fact, he barely ever thought about that baby. Back to the Nest, he went back to networking, bought new parts and changed his name. After five years he had raised enough money to move to The Lakes.

Now he was the owner of a residential module version HM; five virtual dolls - they would be soon nine, because he was waiting for the shipment of a new lot of four Asians, bought recently; and an enviable stock of psychotropic drugs.

He was happy. There was no way he wouldn't be, ingesting the right dose of Zantrex and keeping his hyper sensors calibrated. He had fun telling his story to whoever was around, repeating uncountable times that he "had chosen the hardest path." He convinced himself of that day after day. He didn't really have to make that many efforts, since the smooth mud of the shortcuts doesn't really keep for long the footprints of those that passed by.



A LONG DAY

by Gerardo Furtado

© Gerardo Furtado



ARIZONA STATE UNIVERSITY

I woke up with that hoarse, old voice literally shouting inside my head.
“Son?”

I tried to open my eyes, the brightness was painful. Everything was painful. Apparently I had laid down in my clothing, and I had a terrible taste in my mouth.

“Son?”

“Mmmm...”

“Son, are you awake?”

Damn, I forgot to remove the transducer from my head before going to bed and, to make it worse, it was in “automatic answer” mode. What happened yesterday evening? Oh, what an awful hangover! My head was throbbing... Sylvester yawned his terrible cat breath a few inches away from my nose. I thought, “You are so lucky you don’t have a transducer hanging on your head,” but, of course, I didn’t mentally say those words: my mother would hear and, certainly, would raise hell for a whole week.

“Where are you?”

“Home, Mom,” I asked the time and the numbers 8 and 20 took shape upon my retina. “Where do you think I would be at 8 am?”

“At work! Listen, why didn’t you come yesterday? Your father and I were waiting for you, and he is really upset.”

I invented an excuse. What happened yesterday? Where was I? How much did I drink? I only know that my eyes, the back of my neck, my temples—well, everything—ached. I decided to have a bath to see if the hangover might ease up. “Deactivate automatic answer,” I mentally ordered the transducer. Today will be a long day, I foresee... Maybe I should call the station and tell them I am not going to work.. Yeah, that’s it, I will call them. After all, when was the last time I missed work? I cannot even remember.

I removed the transducer and put it on top of the sink. I threw the clothes on the floor and turned on the tap. Wow, that’s good! The pain didn’t disappear fully, but I was feeling much better. I brushed my teeth, combed my hair, and put on the transducer. My model was composed of a metallic semicircle that ran over my head from ear to ear and was connected behind my right ear to a second metallic semicircle that went from the temple to the back of my neck. It looked a little like the headsets I used to use to make video calls through the web, before the 2010s, when I was still in college. Good old times. I remembered the first transducers, so ugly and gigantic. They were rather similar to a cyclist’s helmet. If compared to those, mine was a technological wonder. Naturally, mine was not even close to the best transducers, such as those by NeuroVigil. They have a new model that doesn’t operate over the retina or the ear neurons, but directly over the brain neurons, those on the cortex, I think, but I don’t remember precisely. A colleague assured me that the sensations are amazing; it is perfect for augmented reality, virtual reality, transgressive reality, interpersonal reality... Anyway, it is perfect for everything. A consumerist’s dream, but incompatible with my meager salary as a federal police agent.

I stopped dreaming with open eyes and began to plan an excuse. The superintendent was crankier lately than in average, so my excuse had to be particularly good. But, at that exact moment, I got a phone call. As the saying goes, speaking of the devil... While I put my socks on, I mentally said, "Reduce the volume and pick it up."

"Where are you, miserable creature?" I will need patience; this day promises to be long...

"I am on my way, sir..."

"I am not at the Superintendency. Come to the airport, immediately!"

Sylvester stretched and rolled on the bed, stopping belly up. "Yeah, keep sleeping, all comfy, while I go to earn your cat feed."

The headache came back. No wonder, the avenue that led to the highway was in the throes of an epic traffic jam. Maybe the pain would decrease if I were not effectively in charge of driving my car, a museum-worthy 2008 Ford Focus. The guy in the car beside mine kept his hands behind his head, while mine had to hold the steering wheel. This is one of those moments when I really crave having a remotely guided car. Right now, I could keep my eyes closed and listen to relaxing music to reduce the hangover. But, willingly or not, I will have one, because the government decided that in three years all the clunkers like mine would have to be removed from the streets. "Play Beethoven, Seventh, second movement". I tried to relax a little.

The airport was almost empty. The new customs agent was a delicious little thing, but I was not in conditions to be very friendly. She took me to the interrogation room. The superintendent, Marshal Paiva, and another agent were staring at a

finely dressed, tanned, fair-haired man. My attention was immediately drawn to an object on the table.

It was just slightly bigger than a cereal bar. It was composed of little cubes about one centimeter squared. I counted ten cubes long, three wide and three high: so, ninety cubes in total. Each little cube's ridges were made of a metallic material, while the interior was a semitransparent, multicolored mass. Very beautiful, to tell the truth. I checked it more closely, and it looked like each cube was built of repeating structures even smaller...

"Do you have any idea what kind of drug this is?"

Drugs had been legalized all around the world. The US, Europe, Australia, Canada, Japan... But here, since that preacher won the election, repression had become much more strict. We were driving in the opposite direction of the rest of the world. Because of that, apprehensions in the airport happened almost daily; in most of the times, it involved average people that didn't know (or didn't bother to check before travelling) that they were forbidden in Brazil. Normally we would apprehend the drugs and explain the situation to the dismayed traveler and allow him to continue his trip. Occasionally, though, we would bump into people who were deliberately importing drugs.

"No, but I can tell you what this is not", I answered.

"Very well," said the superintendent, "the guy caught with this arrived from New York and had a connection to Johannesburg in a British Airways flight. We can talk freely; he apparently doesn't understand one word of Portuguese." I was wondering if the man in the suit had activated automatic translation, but I realized that he had no transducer. Probably the boys removed it right after his detention—standard procedure when a suspect is considered dangerous. "Since

we discovered this device, he's stopped talking and refused to collaborate. He is not saying anything. So, what this is not?"

"This is not a drug of my knowledge."

"Isn't it MDMA?"

"No."

"Maybe crystallized LSD?"

"Are you crazy? This amount of crystallized LSD would be enough to take the whole world on a trip," I exaggerated. I looked again at the object. "To begin with, why are you so sure this is a drug?"

"And why would Mister Congeniality refuse to talk, if this was not something illegal? Anyway, if it is not a drug, you will have to discover what it is. Take this to the Superintendency. Paiva will follow you later and take our good friend here."

I was afraid of touching the object. "Did you talk with the biosecurity guys? What if this is a virus or bacteria?"

"Stop being such a sissy, the guy was transporting this in his hand luggage, covered only with a tiny plastic cover." He pointed to the cover at the other side of the table. "It's obvious that it is not a virus."

Here I went, crossing the city in my Ford Clunker, the headache giving no signs that it would ever be appeased. We met at the office and gazed mesmerized at the object. None of agents had any clue of what that could be. At that moment, the IT agent entered the room and asked an irrelevant question.

I answered, "Later, Josué, later. We are very busy right now."

"What is this?", he asked, coming close to the table.

“I have no idea. Do you have a clue?”

“May I?”, he asked.

I nodded approval.

He picked up the object and observed it closely for a few seconds. Then, he returned it to the table.

“In fact, I know what this is”. We all looked at him, in moderate disbelief. “This is compacted DNA.”

“What?” I asked. “DNA?”

“Yes. We use DNA to make permanent backups, but normally we keep it in a solution. We might eventually have to compact it for transportation, or to transfer information in secrecy. This is compacted DNA, but I never saw this type of compression... And never in that quantity. It’s beautiful...”

“What do you mean by that quantity?”

“These little cubes have around one cubic centimeter, right? Mmmm... each cubic centimeter must have around 800 terabytes, or maybe 1.6 petabytes, depending on the way it was compacted. Let’s see, 90 cubes? This makes...70 petabytes, give or take. It’s a lot of information. Where did you find this?”

“Can you read this data for us?”

“Here? No. We cannot do that job; all the DNA synthesis and sequencing is outsourced.”

“Call the superintendent,” I said mentally. A few seconds later he answered. I briefly explained the situation in a deeply silent room, while everybody admired the object. This is one of the transducers’ wonders: once they can read our brain

waves, I don't have to speak if I want to make a call or do any other task. My headache appreciated that help...

"I am on my way", he answered.

Half an hour later we had a meeting in his office. We explained our latest suppositions.

"If this is just a DNA data storage, why did Mister Congeniality refuse to talk, since this is legal?"

"Did you ever mention to him that we suspected he was carrying drugs?"

"No."

"If he stayed silent," I continued, "it is because he was doing something illegal." And, if this thing is legal, I assume what is illegal is the information that it contains.

We all looked nervously to the multicolored bar.

"We have to discover what this contains. Now!"

Josué explained to the superintendent that this type of compression was new to him and dissuaded him from using the sequencing service that the Federal Police normally used. He suggested contacting Fernandez, a College professor, who had the best equipment available in Brazil.

"That's your job, Maurício," my supervisor shouted to me.

Well, here I go, in my Ford Myopia, crossing the whole city to reach the campus. It was unbelievably hard to find his department (I remembered my days as a student...) and even harder do find the professor's lab. When he saw the black vest of my uniform, he realized that this was a serious matter.

I asked two students to leave the lab, and we closed the doors to talk. I showed him the object.

“It’s beautiful!”

“I know, that is what everybody says. Listen, Professor Fernandez, can you sequence that?”

“I believe I can. I will try.”

“Without destroying it?”

“No, I am sorry, but that is impossible. I have to dissolve it to be able to sequence it. There is a laser sequencing method for compacted DNA, but it is not compatible with this level of compression. But you have no reason to worry. Do you see those minicubes? Do you realize that each one has thin vertical and horizontal lines? We call them a grid, and they divide the minicubes into microcells. These minicubes have 1,000 microcells each. I will remove only one out of 90,000, to use in the sequencing. And after the end of the process, I can synthesize the DNA again. But, obviously, not in this level of compression...”

“Yes, obviously...”

We exchanged our universal identifiers, so he could call me right after he finished whatever he was going to do. I returned downtown with my old wreck of a Ford, taking the park’s avenue. I love to drive on the park’s avenue, even if it takes longer, because it always calms me down. “Time?,” I thought, and visualized “12:42 pm.” “Find Paiva”, I said next, and the arrow indicated a restaurant that was passing by my right window. I pulled the breaks, made a quick curve, and entered the side street. A pedestrian who was getting ready to cross gave me the bird. I was going to give it back to him, but I restrained myself in time. By law,

all the agents' mental activity is monitored and recorded. To insult someone or commit other illegal acts, we have to remember to remove the transducer first.

All the boys were at the restaurant. We had lunch and then returned to the headquarters.

"So, what was it?"

"It will take some time, boss," I answered. "Don't worry; the professor will call me as soon as he gets any information."

"I hope that will be soon. I am not very sure, but I think this guy"—he pointed his thumb in the direction of the lock up — "he has debts, serious debts. We checked his information... American citizen, armed forces, a Marine, Pentagon, etc. What this guy was carrying must be very, very illegal."

"We will know soon."

I took an aspirin and an antacid and sat at my desk. A pile of papers was waiting for me. "Oh, no....not today". I only wanted to be in my bed, with my eyes closed. At that exact moment, I got a phone call. "Professor Fernandez" appears at the gray background of my closed eyes. "Pick up."

"In approximately one hour, I will have the reading."

"I am on my way."

I crossed the city once again, and once again I got lost on the campus. I finally reached the professor's laboratory.

"So, professor, what have you got for me?"

"Sit down." I hate when people tell me to sit, it never precedes good news. "It is complicated", he says.

“What happened?”

“First, the information is encrypted. Terribly encrypted. It will be impossible to decipher it without a key. You can even take this to the police IT team, but I really doubt they will be able to grasp anything.”

“So, it is impossible to discover what this is?”

“For now it is. But this is not important. Do you remember that you mentioned, in the morning, the amount of information you suspect that this device contained?”

“Yes... four petabytes, or forty petabytes, one of these two...”

“Well. The thing is: this nice DNA package was written with the maximum possible compression. We never use this level of compression, because it is more prone to mistakes and also because it is not really necessary. Are you following?”

“Sort of.”

He made a pause. He seemed to like to add a touch of drama to a narration.

“The microcell that I sequenced has 140 petabytes...so, each cube has 140 exabytes of information. So, the whole package has 12 zettabytes of data. Twelve zettabytes! This means we have 12 thousand exabytes, 12 million petabytes, 12 billion...”

“I’ve got the picture, professor.”

We looked at the object on the center of the table.

“And what does this mean? What is all this information for?”

“I have a hypothesis... Do you remember when Google was closed, in the aftermath of the Nipo-Chinese war? Well, do you remember the rumors that, in the middle of the mayhem and the chaos of the company’s closing, somebody

stole all the information that they had, both open and secret, public, private, and everything else? That is, that somebody had stolen, so to speak, the whole internet?”

“Yes, I remember...”

“That alleged theft, that information, it is the Holy Grail of the modern world—even if that episode not confirmed, of course... Well, 12 zettabytes is more than enough to keep all the world’s information that existed at the time.”

We looked simultaneously at the object on the center of the table. I picked it up and got up.

“Professor, I believe I don’t have to remind you that you shouldn’t mention this to anybody, right?”

“Sure, sure!”

“I have to return to headquarters.”

“Yes... in the meanwhile, I will keep synthesizing the DNA that I sequenced, OK?”

“Sure, of course, naturally.” I had completely forgotten that.

I crossed the city once again in my Ford Jalopy and ran up the stairs of the headquarters, without waiting for the elevator.

“Boss! I—”

“Maurício,” he cut me off. “I will need to get back that DNA. Things have gotten really complicated; the American government intervened. We released Mister Congeniality and we will have to return the DNA.”

“But, boss—”

“There is nothing we can do, Maurício. I am going to the consulate right now. Do you have the DNA?”

“But, boss—”

“Oh, one more thing: that little piece that was read at the University. Go back, pick it and make sure that there is no copy of the information.”

“But, boss—”

I returned the multicolored bar and returned to the parking lot. On my way to the campus, I parked my car. (The rules forbid accessing the Web while driving in a car that is not remotely guided, like mine.) I asked “research Google’s history.” I closed my eyes to have a better view of the information; the sun was already setting ahead of me. The rise and fall, the final days, the government intervention, scandals, information leakage... I open my eyes and turned the key. The motor started with a grunt that was not particularly promising.

The professor gave me the sequenced DNA, a little sealed tube, very different from the little colorful squares, and I explained the situation. I asked him to erase all the sequencing information from the computer, in my presence.

“Sure, of course. But don’t even worry about this; it is not necessary, because this kind of encrypting you would never be able to decode unless you got the key...”

We erased everything and he led me to the building’s door. As I was leaving, he asked me, “It is what I thought it was, right?”

“I cannot say, professor, I cannot say. Nice to meet you.”

I crossed the city for the thousandth time in my non-remotely-guided Ford. Night had fallen; the signs’ lights were illuminating the world. I decide to return home.

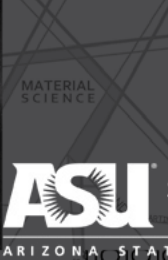
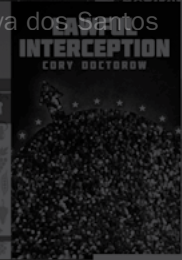
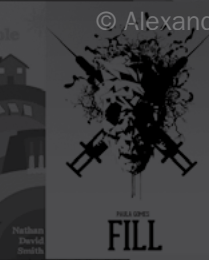
I prepared a cup of antacid and laid down on my bed. “What was that, Sylvester? What information it contained?” Sylvester gave a big yawn, closed his eyes and lay on his side. “I wonder if it was what I think it might be?” I got a call, “Mom.” I removed the transducers from my head without picking up. In 10 minutes I will call her back, I thought.. Lying down, still in my clothes, I put the transducers on the pillow and began to slowly massage my temples. The headache was almost completely gone. No hangover is eternal, after all.



THE COLOR OF YOUR EYES

by Alexandre Oliveira Silva dos Santos

© Alexandre Oliveira Silva dos Santos



ARIZONA STATE UNIVERSITY

Coffee was ready when I woke up. The coffee maker had a clever program. It was connected to my cell phone's alarm clock. As soon as I turned it on, the maker would begin to operate. This would give me enough time to have a good shower. In fact, this was not the only task performed by these new cell phones. Looking back in time, this would be, in itself, a relevant evolution, but it was not even close to the discovery that changed dramatically the history of the human race.

While I had my coffee, I listened to the news to recall it all: It's been 12 years since the explosion of the Large Hadron Collider. In one of the efforts to reproduce the Big Bang, the shock between atoms generated a disproportionate amount of energy, causing an explosion that killed 47 of the 48 scientists at the lab. The energy dispersed affected only those in the immediate vicinity, but data decoded by the computers of Meyrin during that episode revolutionized science.

They revealed a new dimension of particles, generated by the Higgs boson. One of them was named Qayin. Much research was developed with the only survivor till the laboratories realized how this particle interacted with human DNA. It could shape it to optimize the natural defenses of the organism, increasing its physical abilities and removing any type of contamination. This meant the cure for several diseases, such as AIDS and cancer, and total immunity to any other biological weakness that might occur.

I turned the television off. Yellow press would explore this story exhaustively in the following weeks. I opened the doors of my car with Bluetooth, and the panel exhibited a message: “Good Morning, Mr. Walts.” I drove to the psychiatric wing of Geneva University Hospital, where I was going to meet a new patient - that same scientist who had survived the explosion in Meyrin, John Druker. Apparently he had developed a psychotic condition and an aversion to electronic devices in the last few months. After the traumatic loss of all of his colleagues, he began to tell stories about other dimensions and abductions that might indicate his unhealthy state of mind. Now he is taking some pills to sleep and spends part of his day under medical observation.

I understand part of his fears. Humans that received Qayin injections were miraculously cured. Blind people could see again, and paraplegics recovered their movements after a few months. All of them gained immunity to diseases and even the aging process was delayed. Naturally, even if close to perfection, this procedure had some small flaws. Twenty-four hours after the injection, the iris would become metallic blue, completely changing the patient’s appearance, reflected in the eyes’ color. It is said that the eyes are the windows of the soul and, in this case, they seemed to be completely closed. It was like removing the humanity from those who experienced a cure. What could be the price of a miracle?

What an irony! On the way to work, traffic was stopped by a religious group protesting against the use of Qayin. Their signs read, “You are selling your soul.”

The truth is that society is divided by these events. The Qayin treatment wasn’t cheap. Those who suffered from terrible diseases lost their faith when they experimented with the new kind of redemption. I am saying that religions lost their followers and became organizations with little power of persuasion in the

world. Some government leaders still keep good connections with the population, but science became the most frequent prayer in the life of any human.

I was a very religious kid myself, but I lost all interest. I believe that, if something is capable of eradicating certain human diseases, it cannot be totally bad.

My arm was a little painful, and I felt weird after the injection, but my vision problem seemed to have disappeared. Either I did that or would have to be submitted to a laser surgery to avoid blindness.

It didn't take long for me to reach the hospital, where I was received by an assistant:

-Doctor, he is ready!

I picked my stuff up and went to the room where Druker was. It was easy to open the door, but difficult to face what appeared in front of my eyes.

There was very little left of the scientist. His clothes were still white, but now they had restraining belts. And his short, messy hair, overgrown beard developed a dirty, awkward aspect. The almost skeletal man in front of me had yellow, apathetic eyes, maybe because of lack of exposure to the sun or due to his mental state. By chance, he had only shown signs of violence against the *Nods*. At least, I still hadn't become one. But in a few hours it will be different - but he won't know it beforehand.

- Hello, Mr. Druker. I am Able Walts, your new therapist. I understand you have been having some very hard days. I am here to talk with you for a while. What do you think of sitting in this stuffed chair to relax so I can ask you a few questions?

Coming from the end of the white room, with his hands slightly restrained by the strait-jacket, he sat down. He stared at my eyes, looking for something.

-Yeah. It is not possible. Your soul cannot be saved anymore. hesitating, with a shaky voice, sedated by pills, he expressed these few words:

-So, you believe in the soul?

-Are you religious, John? I asked back.

-Religion cannot either. It caaaaanot. He got up in fury, shouting while his syllables projected saliva. He continued:

- I told them, what was there killed everybody and will kill many more in order to arrive here.

He would skip from wrath to wailing in a few seconds. Poor guy, experiencing the explosion had been a really big trauma. Some patients develop serious phobias related to some element related to their trauma. This could explain his technology aversion.

-Calm down, John. I imagine how difficult it was for you that day. You are full of intense emotions and unresolved memories that need to be exposed. You will feel much better after talking to me. I know that many others have listened to your story before, but I would like try to help. May I?

-Alright! He dried his tears and stopped the sobbing to start his narrative.

In the beginning his tone was insecure, not so much about what he was saying, but rather because he was anticipating my rejection. He told me that, that day, something went wrong at the LHC. The energy readings registered by the computers were above the average and, even then, the test routine began.

Several explosions happened before the main one. Then, the energy surge was such that all the electronics in the surroundings turned off. The cameras couldn't register that part of the collider walls were torn like a sheet of paper.

John realized that the biggest fear of the scientific community had happened. A “wormhole” the size of the explosion was open. Whoever was inside was transported to another dimension and, at that moment, a frightening story began:

-Everything was dark and even the darkness seemed to be absorbed by something that we couldn't see, only feel. It was this terrible feeling of being immersed in a place where nothing that we knew existed, not even time...or space. he paused for a while.

-I looked around, trying to rub my eyes and wake up from that slumber, and my search for the safety of vision revealed to me the greatest insanity that the human mind could capture. An aberration. With a body similar to a jellyfish's or a sea wasp's. Translucent, but dark and with a vascular system that carried to the top a goo thick as crude oil. The upper part looked as if a few toads were fused, forming three nose-less, mouth-less heads. Only eyes, dozens of them.

I felt worried that he seemed to be really seeing the scene he was describing, but I let him continue.

-Its claws seemed to grow or retract according to its needs. He was somehow connected with that universe and that connection reached each one of the scientists when we arrived. I felt what they felt and we could listen to the thoughts of the others. The creature was obsessed with our existence, something that I had never seen before, and it was as if it had read our souls and discovered Humanity. Then it tried to touch us, as if it wanted to possess all of us, but apparently our bodies couldn't stand this energy. Every time one of us was touched by its clawed arms, we could all feel the same pain. The thick goo that it carried in its interior began to leak from my colleagues' heads and then their

eyes and bodies lost their vitality until their death. One after the other they died that way. Somehow the heavens seemed to be getting darker to illustrate the despair of that being that couldn't take possession of its new toys. John seemed to be getting very emotional while remembering all this - I mean, while he recreated the fantastic story in his mind.

- I was afraid, when its gooey arms came in my direction, and closed my fist, without realizing that it held my cell phone. I hold it ahead of me and felt an unbearable pain when I touched one of the freak's disgusting claws. That's when a ray of light came closer from afar. I thought it was the end, but this was the energy of the explosion that was contracting and taking me back home. When I came back, I was the only survivor. All my colleagues were fallen on the floor, dead without an explanation, according to the paramedics. I tried to believe that it was not true, but I looked at my cell phone and it was covered in some goo. I felt that the entity was still around and knew that its vestiges had remained somewhere. I destroyed my cell phone, but it seemed that this was not enough. It had already been connected to the laboratory network and to myself.

The room was taken by an ironic, sadistic laughter. It was the first time I had seen John smiling, and I didn't like that in the least.

- Do you want to know what could save me? I am already corrupted, but I didn't have a choice. Now, you are allowing it to happen. Do you really think that that computer would solve the Qayin formula by itself? It is alive, it is inside of me and now it is trying to discover a way of connecting with all humans.

Patients with such ability to describe a hallucination in detail are rare. The truth is that John Druker was exposed to some sort of radiation during the explosion and tests revealed that he was the first man to present Qayin in his cells. His

structure indicated how this particle could be used to produce a powerful vaccine. It's a pity that the first and only being that was cured without having collateral damages lost his mind that way.

This was the ideal moment for the confrontation. I felt my pockets, looking for some gadget and found my cell phone that carried a few songs that I liked. I put it on the table and realized that the patient's eyes converted into an abyss of fear.

-Put that away, he can appear! John said as he ran to the corner.

-Here, John, it has only a few songs, photos and a data connection with Overgate it's a kind of internet network hundreds of times faster than 7G, developed with Qayin quantic technology. It only works after sunset, but that's OK.

His dread and shouts increased, but it was time to expose him to reality. So, I looked for a music app to initiate him.

- Wait, the system is jammed. I will show you that...hey, what is this? a shock repelled my fingers.

I heard lamps in the hallways bursting. The screen of the cell phone broke in two and I couldn't approach it with my hands. The electricity began to invade the device, sending a wave in all directions in the room, like a magnetic explosion. The energy broke the cameras, bent the door and threw the table towards the wall.

John fell on his knees and it seemed like something had invaded his head. It looked like it was going to explode. Energy kept flowing out of the gadget with no respite. That is when I felt a real and crazily powerful presence occupy all the room. An intense light, almost like a white fire with blue borders, began to shape up.

It crystallized claws hang over the eyes of Druker, almost crushing them. Then they came in my direction. Even if I kept my eyes closed, I could see, and this made it all the worse and scarier. While I touched my eyes, I was connected with that conscience and began to understand all its past. If we could compare it to something in our reality, it would be equivalent to some ancient god, ancestor of the universes. Above time and matter, carrying in each of his traces thousands of years of an existence that couldn't be assimilated by the human dimension. The pain was just like that of a thousand needles that played with my organs, but the entity knew that my brain was swinging between a solid state and a grayish soup thanks to that communication.

That contact with John's cell phone made it realize that it could hide among the bytes. Thanks to the Wi-Fi networks, it could pass from one device to another and now it could live in practically all the equipment connected to the internet.

Most of its consciousness was still within the limits of the universe. It knows that our scientists opened the portal once and can open it again, but this time it doesn't want to lose the lives that it was so eager to conquer.

With a malignant ability to deceive men, it showed ways of reshaping the human DNA, making our bodies stronger and open to its possession while it engages in the nourishment of our souls. With Qayin, thousands of men became *Nods* - that stands for Non-Degenerative New Organisms. Without it, John Druker was the only one capable of establishing a connection with that being. But it tried through mobile phones and computers. I can see every death and every disturbed mind that it created after touching their brains without success during the possession.

Qayin is, in fact, the ruin of humans, but one thing was still missing. It missed. Men created a new and more potent network of computers based in a connection with rays that would wander all around the Earth, getting reflected by satellites to transmit data at speeds faster than the light's. At that time I couldn't resist anymore at such a high volume of information. I remember that I heard steps arriving. I looked around and saw that John was foaming at the mouth. There was also blood; I think he had bitten his own tongue. That's when I passed out.

I woke up at the infirmary. It was night time already, and my vision was still blurry. A woman arrived with a painkiller for my headache. I asked her what happened and her answer was obvious. Druker had bled to death, severing his own tongue. She told me that I could have a day off, but I knew they were blaming me for the death of the patient. In fact, this wouldn't be good for my career, but who cares for a career when you don't have a future?

The girl was a Nod. I looked at her face - I didn't realize before how the metallic blue of her eyes made her life so artificial. I entered the car and my digital reader began to read loudly the feed headlines. The Overgate project, on the internet, had been activated. In a few hours the world would discover a new way of being interconnected.

On the way home, the protest that had slowed the traffic down since that morning was still going on, but now it faced, on the opposite side, a line of policeman, some of them *Nods*. Their eyes shone like those of a cyborg. They seemed rigid and devoid of emotion. I realized that they didn't change, unlike my own way of looking at them. I noticed that some had black goo flowing like tears. It looked like their souls were crying, locked in those bodies, and then I understood that the plan conceived by the freak described by John had succeeded.

At home, I turned on the TV. That's when I realized that the news was about a state of civil emergency. The full HD transmissions had hissings that were unknown since the 1980s and cell phones had no reception. Lights went out, together with the electricity, and I knew that this was the beginning of the end. I was so tired that the only thing left was to sleep on the balcony, looking at the stars and cursing what they had hidden.

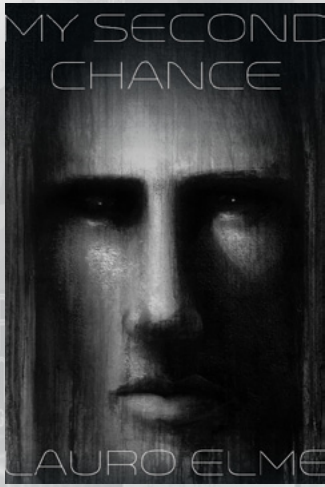
The world had completely changed when I woke up at five a.m. Abandoned cars, people lighting bonfires, and children crying for their parents who hadn't returned home the previous night. Those

Nod policemen were there, now with their grey skins and dark veins that seemed to pump oil instead of blood. They didn't have a human voice or self-will, and if they still had any soul, it was hidden in the metallic blue of their eyes.

On the street, a car played Guns N'Roses "Ain't It Fun": It is not really funny when you know you will die young. Or maybe it is funny... Maybe it is. Every minute that goes by the Qayin makes me feel less human. I know this because of the mental connection with the other *Nods*. We are receiving constant orders from the entity that intends to cross the dimensions till it reaches our universe. It used the Overgate connection to get transferred to all modified humans and assimilate their existences.

I still have a few hours. The humanity that I am quitting is not totally lost. Only I and a few thousand that surrendered to the seductive promises of life without imperfections.

I looked through the window and in the reflection I realized my eyes didn't have the human shine. Nothing was left for me, except sitting down and enjoy daybreak, while I can still listen to the Guns.



MY SECOND CHANCE

by Lauro Elme

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I hold the palm of my right hand to my shoulder so the camera can make the identification. What happened before this is hidden by clouds. I don't know where I am or how I arrived here. But I am home, and that's what is important, even if this hasn't been a reason for joy in the last few years. The camera doesn't recognize my hand; it turns on a red light and asks me to look directly to a certain spot to read my face and retinas. I obey impatiently. Damned incompetent machines.

I lift my hand to my head to brush away any hair that might have fallen on my forehead, and I am startled when I realize that it is covered in bandages. It's painful. An accident, maybe? This would explain my confusion and lack of recent memory. On the other hand, accidents are rare these days. There are so many computers that monitor roads and vehicles that it is almost impossible to get run over or to hit another car. Maybe I fell and hit my head. This is more likely. After all, I am not a young man anymore. The machine turns on the red light again. I don't have any other option but to ring the bell. But I am so impatient that I decide to knock with my fist, just like the troglodytes in old times. The sound doesn't penetrate the door of aerated plastic wood, so I knock again. This time harder.

I wait for an eternal twenty seconds, till somebody comes to the door. That gives me time to speculate about what might have happened. If it was really a fall, somebody must have helped and treated me. Where are the nurses and doctors?

Did a *robulance*, a van driven by machines, drop me at the door of my house? So ironic, I have seven cars in my garage, but I was driven by a *robulance*. Finally the door opens up.

A boy who is probably six years old stands in front of me. It takes a while for me to recognize him. He has a *hologame* in his wrist and he is moving his arms frenetically, fighting against enemies that only he can see. "Hi, buddy," I say, trying to get down to pick him in my arms. But my head aches a lot and I stop midway. He immediately jumps back and runs to the living room. "Mommy!" he calls, almost shouting. The bandages must have scared him. I close the door and go straight to the stairs. I have to get a painkiller or my head will explode.

Before turning on the stairs that will take me to the bedroom, I see Silvia coming from the living room. The boy hides behind her. Silvia is as beautiful as the day I first met her. In fact, instead of delighting, this disturbs me; after all, we have been married for twenty years. The multiple beauty products and constant SPACs (Surgical Processes of Age Conservation) gave her the looks of a wax doll. No matter what others think, this is certainly not natural. It only seems to please her young lovers.

"Who are you? What are you doing here? I am going to call the police," she threatens. I want to tell her who I am and that I am in my house, but the headache obliges me to turn my back on her and activate the mobile stairs. Normally I am not that harsh, but this pain... On my way, I see Carla, my fifteen-year-old daughter, coming down the other stairs. She looks at me as if I were a complete stranger. But this is normal; she has been acting that way since she was twelve.

Carla brings in her arms her inseparable *dogmachine*, a perfect poodle imitation, a gift from her boyfriend. She has programmed the little robot to bark frenetically every time it sees me, and that's what it's doing right now. This makes my head vibrate in pain. "At least somebody seems to remember me." Carla runs down the stairs and stops by her mother's side. I hear her asking, "Who's this poor guy, Mom?". Silvia is talking on the microcell phone. Is she fulfilling her threat of calling the police? "I wonder if we will all act as barbarians today!" I shout while leaving the stairs.

I enter the bathroom and open wide the cabinet over the sink. I am so quick that I do that even before the lights are turned on by my presence. I look for something in that cabinet that might stop the pain. I want something really strong, such as a good and obsolete analgesic pill, but I only see anti-depression led flashlights, electric impulse patches and acupuncture kits. I throw it all in the sink till I find what I want. I put two painkiller pills on the palm of my hand—no, four are better—and I take them with a sip of tap water. I wash my face and, despite doubting their effectiveness, I decide to pick two electric patches. Any help is welcome. The patches must be installed on the temples, so I close the cabinet door to remove the bandages from my head.

Only then do I realize it. The image I see makes me suddenly dizzy and I hold on the sink to avoid falling. I understand my family's reaction when I arrived. Whoever looks at me from the mirror, it's not me. Another man is looking at me and imitates my gestures. Maybe I forgot how my face really looks? Impossible. I still remember the red circles under my eyes, my round nose and prominent chin. So, who's this person that looks at me from the mirror? With my fingers I touch the digital mirror. This might be publicity, like the ones that appear every

morning on that mirror when I am brushing my teeth. But the screen is off. It is really a mirror. A mirror that shows somebody that is not me.

I suddenly feel breathless. Panic. The old syndrome that I carry with me since childhood and modern psychology couldn't cure. I have to go down, to talk to Silvia and try to explain who I am. To discover who I am. "I hit my head," I say loudly to the other person on the mirror, "and, when I woke up I had this appearance."

"I have already called the police!" Silvia shouts from downstairs. I have to go down, explain to her what is going on. I go down the stairs. Silvia stands in the same place I left her.

The microcell phone was attached to her left ear and a non lethal shock gun on her hand. "You'd better stay away. I have already called the police," she repeats.

"It is me, Silvia," I began to say. "I am your husband..." I want to tell her my name, but I am not sure what it might be. I don't remember. My head is aching again. I chew two extra pills. I am getting crazy. That's what's happening, for sure. I would better go away to avoid scarring my family. The police won't help in any way. It is better to go. I leave to the street in the exact moment when the electric police car appears, silently, at the corner.

I walk fast past neighbors who don't greet me. They don't recognize me. I walk for several hours without a destination. Without knowing how my life turned upside down.

I spend many hours sitting at a mall's bench, seeing wax dolls walking by with their superfluous purchases. I remember Silvia. When did we grow apart? I think of my children and I don't feel they are mine. Not even little Victor (now I remember his name), who preferred the old gardener to me a thousand times.

I reach the conclusion that, despite all the money I made in this life, I am not a rich man. I have a wife who wants to stop time and please young lovers, a daughter who hates me, and a son who ignores me. To complete the picture, I now also have a face that is not mine. By the way, it is not just the face. While sitting and lamenting my fate, I realize that my hands have also changed. They look darker and less wrinkled. I am also taller and less hunched. This stocky body is also not mine. Maybe I underwent a SPAC intervention? Did Silvia somehow convince me to get submitted to a treatment, also converting me into a wax doll? I lift my hands and massage the bones in my face. It feels like I am caressing another man. It doesn't look like a rejuvenated version of my face. It is not the artificial face of somebody that underwent a SPAC. No, definitely, this is not me.

A cleaning robot zooms by me, sweeping a floor that is already clean. "What time is it?" I ask, ignoring the watch on my wrist.

"One hour and two minutes p.m.," the gadget answers, with a disturbingly human voice.

"Thanks," I answer, even knowing I won't receive a reply. It's peculiar—these robots are programmed to thank you every time you give them way or lift your feet for them to sweep under a seat. But they don't know what to say when someone thanks them for their services.

I feel like walking around. I don't know exactly where, but I feel an urge to go away. I enter the first taxi that I see standing by. Unfortunately it is a *robotaxi*. As soon as I enter, a screen lights up and a voice announces: "Good afternoon: please type or say the desired destination."

"I just want to ride around town, without any specific destination," I answer.

The *robotaxi* threatens to go, jumps in place but brakes to stop. “Good afternoon: please, type or say the desired destination.”

I leave and look for a taxi with a real driver. I find one five minutes later.

“Where to? If you prefer, you can type the address on the screen in front of you.”

“We are just going to ride a little, without destination,” I answer, sinking in the comfy seat.

“Do you have credits?” That’s a question that a *robotaxi* would never make.

I look in my pockets. They are all empty. “That’s all I have,” I answer, showing my gold watch.

“That’s a museum item, boss.”

“For that reason, it must be worth several credits. Can we ride a little?”

“With that, you can go to Mars if you want.” He smiles and puts the watch in his pocket.

“Have men been to Mars? ,” I ask, curious, as soon as we begin to roll.

“Were you in coma, boss?” the driver asks, pointing to my head. “Men landed on Mars last week.”

We rode for a long time on roads chosen by chance by my driver. “Enter here”, I tell him, when we pass by a large avenue lined with artificial trees.

“Do you remember now where you want to go?”

“No, but this seems to be a good way.”

“You make the decisions, boss.”

A little ways ahead, I show him another street, and then another. I have no idea where I am going, but I feel as though I might know this neighborhood. In my way to my office and strolls with the family, I never came to this part of town, but, even then, I keep indicating street after street with a surprising self-confidence.

The driver stops at a small square in a suburban area. "What now? Where to?"

Five streets radiate from the square. "I will get out here," I tell him.

"This place is a little too dangerous for you to walk by yourself."

"I will be okay, thanks," I answer, getting out of the car. Before I get away from the car, the driver reaches out to me through the window and hands me a small wad of bills. "It is your change. It is not credits, but there are some places that still accept this kind of money. Good luck."

"Thanks", I answer.

As the car pulls away, I look at the streets ahead of me. Where am I? What am I doing here? My head is less painful now. I feel like removing the bandages, but I give it up. I pick a street randomly and begin to walk. I don't go very far before feeling attracted by a small two-story house squeezed between two bigger houses. I stop by the gate. An antique gate, made of real wood. There is no identification sign with retina readers and all that silliness. Just a traditional ring. I have no intention of ringing it or to clap hands like the cavemen used to do. I just stand there, in front of the little house, as if it could give me some answers.

At that moment, the door opens and a girl of about four comes from the garage shouting "Daddy! Daddy!" Not knowing what to think, I push the gate with my hands and go down to receive one of the rare warm hugs of my life. Her name is Raquel.

I don't even imagine how I know this, but I do. Raquel covers me in kisses while her little arms squeeze my neck. I feel tears in my eyes. It was impossible not to fall in love with a little creature like that. A woman appears through the slightly open door. I immediately try to remove Raquel from my neck and to put her down on the floor, so I won't be accused of being a child kidnapper. But the woman doesn't seem startled or scared. Her expression is a mix of surprise and joy. Her name is Sofia, my mind says. I never saw her in my life, but I somehow know her. She is not as beautiful as Silvia, but her beauty is natural and pleasant, without creams or plastic surgeries that stretch the face.

Sofia invites me to enter and sit down. She offers me water and prepares something for me to eat. Only then do I realize that I am starving. Raquel stays by my side all the time. Sometimes I feel like crying for getting so much love from people I never met in my life. Sofia is a total mystery. She treats me with respect and care. Sometimes she looks at me with shiny eyes. Sometimes she seems to feel like hugging me, just like her daughter did. Other times she seems to want to broom me out of the house. She only begins to talk to me one hour after entering the two-story house. We are sitting on the sofa of a living room that was simple but quite cozy. Raquel plays on the floor with little colorful construction blocs. No holograms or virtual images.

"Who are you?" asks Sofia.

"I don't know." I answer. "I thought you might tell me."

"Why me?" she asks again.

"I was attracted to your house, where I had never been before. The girl called me father and, despite having never seen her, I feel a very strong connection with her. And with you," I add, blushing lightly.

“Your name is Fred,” Sofia began, “or rather, it *was* Fred. Your true name I don’t know.”

“Is this Fred’s face?” I ask her, touching my chin.

“Yes”. I wait a century before asking the next question. “So, Fred is dead?”

Sofia holds up her answer for the same length. “Yes.” She speaks with tears in her eyes. “Well, most of him is,” she adds.

I begin to understand what happened and to realize how despicable I am.

I stay silent for a long time, while memories begin to come back. Once in a while I look at Sofia, at the far end of the sofa. I am with two people who have every reason to hate me, but, even then, they were the only ones today to treat me kindly.

While memories keep coming, I speak softly to Sofia and myself: “I was suffering from a terminal disease. I would live one year and a half at most. The only solution would be to undergo a Transcorp, the radical method of total transplant. The idea is simple: they remove your brain, with all its memories, and insert it in a healthy body. In practical terms, though, it is not that easy. The process is very expensive and long. Only some thousand individuals in the whole world have resources to pay for a Transcorp. I am one of them. It demands almost a whole year, with daily interventions, to complete the process. I remember the day when I was admitted to the hospital. I was almost dying when a compatible donor appeared. He had to have a perfect body but he also had to be officially brain dead for the process to work.

“You bought his body,” Sofia says with sadness.

“No,” I reply. “He was dead. His brain was dead.”

Another long silence. When Sofia starts to talk again, it's with a sad but stern voice. "Fred was not dead. He was not even ill. He agreed to participate in a Transcorp so we wouldn't lose this house to the bank. He never told me anything. He had been unemployed for two years. In the last few months, he justified his absence saying that he had a new job. I only learned the truth when I got a letter informing that our mortgage was paid for."

I tried to argue that I didn't know that these things could happen, but I remained silent. It would be hypocrisy. While there were rich men like me, there would be always somebody willing to sell his soul. After a long while, I ask, "So, why did you receive me in your house?"

"You saw the girl's reaction. For her, you are still her father. Your brain and gestures may be different, but your voice and smell are still Fred's. Besides, I feel that a little bit of him is still alive in you."

It is true, I left long before the completion of the process. Somehow I could run away from the hospital before being readapted. Even before my family was introduced to the new body. The process was not completed. Part of the thousand brain connections were not completed. I was living the life of two people, with memories of two people.

"What will happen now?"

"You can stay here till you find your place in this world," Sofia suggests. "It will be good for the girl, who was without her father for so long."

I hear these words and I see Sofia's eyes shining. Fred is here, I feel. She feels. This is my good side. I think about my wealthy and empty life and feel jealous of Fred's riches. I want to do the right thing. I want, at least, to minimize the suffering that I caused. I know that my disappearance will only bring happiness to Silvia

and my children. I want to learn with Fred to be a better person. To love those who deserve it.

We stay for a long time on the sofa watching little Raquel playing in front of us. In a given moment, our hands touch and remain that way. Even if scientists have already proven that God doesn't exist, the sight of Sofia and little Raquel makes me feel that somebody is giving me a second chance to be happy.