

A Life Full of Quarks

(sample)

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Preface

Investing time and money in a book is a lot to ask of a reader. This is especially so for a long, eccentric novel such as *A Life Full of Quarks*. To help you decide, I am providing this free sample of the first four chapters. If you decide to follow the rest of the journey, great! And if you prefer to follow a different narrative, I won't begrudge you.

I, Paleontologist

When I was young, I wanted to be a paleontologist, to unearth things both terrifying and long dead. I suppose this memoir is not very different.

For me, dinosaurs were the gateway drug into science. It came through serendipity: not through spilling chemicals into my breakfast cereal, or through finding a patch of mold in the shape of a Stegosaurus, but through my mother falling asleep without putting me to bed.

My father thought TV turned your brains into oatmeal. My mother, on the other hand, would simply say, “Switch it off if you hear your father come in, Johnny.” She had a free-range philosophy of parenting. Meals, she believed, should be spontaneous acts of invention, unfettered by planning. Sporadic housecleaning occurred whenever she couldn’t find the book she wanted. Growing up in a long-lost era, my older sister and I played without supervision in the awkward toupee of trees on the hill behind our house, and if we ever came to her crying, her only question would be, “Do you require hospitalization?”

Unfortunately for me, she was stricter about bedtimes for six-year-olds, though this could be postponed when she was enjoying her TV shows. I thought it unfair that she got to dictate what we watched: boring husband-and-wife detectives and deadpan psychologists. One evening, while she snored on the couch, I tiptoed to the TV, and hoping to find some cartoons (I didn’t realize they weren’t on in the evenings back then), I turned the dial until I stumbled upon a late-night movie that grabbed my attention with long, sharp teeth. It was about dinosaurs—*dinosaurs eating people*.

It was crude stop-motion animation, yet to me at that age, it looked utterly real: long necks swaying above the treetops; massive feet making the earth shudder and ripple like my aunt’s green Jell-O salad; row after row of monstrous dentition. My heart squeezed each time a dinosaur gobbled up another victim.

When I finally felt about to burst from fright, I shut off the TV and stood very still, trying to listen over the pounding of my pulse. The summer was feral and warm, and windows had been left open to cool the house. From the sofa came my mother’s brassy snores. Then through the open windows, just as in the movie, I heard a slow, steady, ominous thudding.

Dinosaurs—*outside my house*. I almost peed myself.

There was no point in waking my mother. I knew now from experience that an Allosaurus could be standing right behind her, and she'd just tell me I had an overactive imagination. So, I ran out to my father's home laboratory. It was really just our garage, but he had filled it with equipment, and whenever he came home from the university where he taught science, he retreated there. When he did, my mother would sigh, sip her glass, and say, "Well, it gives him something to do."

The lab was a magical and scary place, smelling of oil and ozone and burnt metal. When I went in, my father greeted me, "Hello, John." His welding goggles made him look like a giant bug. He had not actually turned into one, a misunderstanding I wouldn't make a second time. Besides, he had gotten rid of all the cans of Raid. "Not sleepy?" he asked.

"Di... Dinosaur!" I managed to stammer.

"You know, I loved dinosaurs when I was your age," he said with a dry smile. "Magnificent creatures. We humans killed off the mammalian megafauna, of course, but I wonder how would we have fared against a stalking Ceratosaurus, or if we could have brought down a Barosaurus."

"No," I said, barely above a whisper; I didn't want the dinosaur to hear me. I could imagine its hot breath on my neck, reeking of blood. "Outside!"

The goggles were cold and unsympathetic. "John, dinosaurs died out a long time ago. Except for birds. Did you know birds are descended from dinosaurs? Like for dinner just last night, you ate—"

"No, I heard it!" I insisted. I felt panic flood my guts.

After taking off his goggles and adjusting his black-framed glasses, he led me out to the front yard. "To make a claim, we must provide evidence, no matter how fearful the search." He was always saying things like that.

Of course, we found nothing. "Not even a footprint," my father said. "A relief—and yet a bit of a disappointment, isn't it?"

I nodded, my heart still pounding fast, expecting that at any moment, a set of massive teeth would burst out of hiding in the bushes and rip us to red shreds.

Inside, he poked at my mother. "Anne. Anne...? It's ten o'clock. Do you know where your children are?"

She just groaned and turned over on the sofa.

In the morning, beside my breakfast cereal was a book. Its edges were worn, its cover scratched, but inside, there were brightly colored pictures of dinosaurs lumbering through steam-bath swamps and posing in front of puffing volca-

noes, as if the dinosaur realtor had said, “Who doesn’t want an active volcano in the neighborhood? It adds so much character!”

After I finished my cornflakes, I sat on the front steps and leafed through the pages. It was the summer between kindergarten and first grade for me, although I was already reading several grades ahead. Our dog, Bessie, came and laid her head on my lap as I pored over the pictures and sounded out the names letter by letter.

I heard footsteps behind me—my father. “Do you like the book, John? Let’s take a walk,” he said, not waiting for an answer.

We went out the front gate, past a lawn more weeds than grass. My father crouched on the concrete sidewalk. “You’re too young to have thought about time much,” he began. “But let’s imagine the width of this crack in the sidewalk as measuring your life so far.” He placed the tip of his index finger on the concrete ahead of it. “This is my life so far. And this, the length of my thumb, is how old our country is.”

He straightened up and took a short step. “This takes us back two thousand years, to the time of the Roman Empire, to the time of Jesus.”

“Like Gramma talks about,” I offered.

“Like your grandmother talks about, a lot, yes.” He cleared his throat, then took two full strides. “And this is about ten thousand years ago—the beginning of agriculture.”

Walking on to the next house, he said, “Now we’ve gone back about a hundred thousand years, when modern humans began to leave Africa.” Then he strode off down the street and turned the corner, with me and Bessie following.

At the next street, my father held my hand as we crossed. “Here is a million years back, when hominids were coming out of the trees and venturing onto the African savanna.”

We kept walking. The houses gave way to storefronts, and we passed by shops and restaurants and the local veterinarian’s office. “Are we getting ice cream?” I asked, full of hope.

“Hmm? No, John. Now we’re about ten million years back, the middle of the Miocene. No humans at all, just early primates. We’re barely a sixth of the way to the Cretaceous; we have to go six times as far to find the last of the dinosaurs. Do you see, John? Dinosaurs have been dead a long, long time.”

“Jane says...” I began. Three years older than me, my only sibling was a reliable source of misinformation.

“John, listen. You don’t have to be afraid of dinosaurs. They are so far away from our lifetimes that it’s hard to even imagine. Remember that museum we visited at the beginning of the summer?”

I nodded.

“Remember the skeletons? Those were dinosaur bones. That’s all that’s left of them: bones that we dig up from the earth.”

In the morning, I began to dig. In the summer, I spent most of my time outdoors, trailed by Bessie. This was a time when suburbs still had gentle oases of green; relentless development had not yet choked out all but unnatural life. Our house sat on half an acre of land, backed up against an inconstant stream and a gentle slope that led to bristly patches of trees yearning to be a forest. Scattered through our backyard were rickety sheds housing the remains of my father’s failed experiments. Overhead and between the trees, he had strung up sheets of plastic and foil, part of a cosmic ray detector that ran into the house. When the sun was high and hot, Bessie and I sheltered in their shade.

I picked a likely spot, a low point not far from the dry carcass of the stream, and began to clumsily shovel the loamy ground. Bessie sniffed at the soil I overturned, then lay down and fell asleep.

All I found were roots, rocks, and some old tin cans. So, after lunch (peanut butter toast and lemonade, huffily made by my sister, Jane, at my mother’s direction from the sofa), I dug some more.

That night at dinner, I had my dinosaur book open. Grinning, my father patted me on the back. “You enjoying it?” he asked.

“Uh-huh.”

My sister glanced at a page. “They’re from Noah’s flood. That’s what Gramma says.”

My dad frowned. “Your grandmother doesn’t know—”

“What she knows, Alan, is how to push your buttons,” my mother said from the kitchen.

“Who? Your mother, or Jane?”

My mother didn’t answer.

That night, the fear rattling my bones had dissipated. I heard no dinosaurs stomping outside the house. I imagined *they* were now terrified, frightened that I might dig up their bones and stick them in a museum. (My imagination was fertile, but imprecise, casting dinosaurs both as fossils and as living, breathing monsters.) In my bed, I felt safe and triumphant.

After breakfast, I dragged the spade to the far corner of the backyard. I was surprised to see, squatting in the hole I had dug, a little blonde girl about my age. She scooped up dirt with both hands and patted it into a little mound. Already she'd made several rows of mounds, so she had been at work for some time.

"What're you doing?" I asked curiously.

She glanced up and wiped her snub nose, leaving behind a smear of mud. "Making stuff." She had green eyes and was wearing a dark blue dress with white stars on it. Bessie cautiously sniffed the girl, then lay down at her feet and looked over at me; she approved of the girl.

To me, the stipple of mounds looked like the armor plates on the back of an Ankylosaurus I'd seen in my book, but I wasn't sure. "What are you making?"

The girl straightened and surveyed her handiwork. "Friends," she said. Then she amended, "Followers."

"Where do you live?" I asked.

She eyed me with suspicion. "I'm not lost."

"Oh," I said uncertainly. "Um... This is my backyard. I was digging here."

She looked at the ground and frowned. "What're you digging for?"

"Dinosaurs. Dinosaur bones."

She wiped her nose again, depositing more dirt. "Like a paleontologist?" She said the word fluently, as if it she had been saying it all her life. Immediately, I had a crush on her.

"Do you want to help?" I asked.

She shrugged. "I'll watch." She stepped out of the hole, and with hands on hips, looked on as I resumed digging. I dug hard, wanting to impress my new friend.

The sun was high in the sky, I was sweating, and my hands hurt when my shovel hit something, the concussion traveling through my arms all the way to my head. With the shovel's metal edge, I scraped away a bit more and saw a flash of white.

The girl squatted down and put a finger to the white surface. "What is it?"

"Bone," I said, with all the confidence I could muster. "A big one." Together we brushed away the dirt, revealing a curved surface, huge, bigger than me.

"Oh," said the girl. "Neat."

My heart leapt. Then I heard my mother call out, "John, lunch!" I grabbed the girl's hand, and together we ran to the house, with Bessie loping after.

As I stomped into the house, my mother began, "Johnny, are you—" She stopped when she saw the dirt on my hands and shoes and all down the front of my shirt, and the little girl next to me with mud on her nose. My father would have frowned, but my mother threw her head back and laughed. Today she was

in one of her good moods. "You might want to wash up first." She eyed the girl. "And who's your friend here?"

"I'm not lost," the girl repeated with a defiant gaze.

My mother smiled. "I'm relieved to hear it," she said as she placed a plate before the girl.

I squirmed all the way through lunch, only taking a couple of bites of my sandwich before saying, "Can we be excused, please?" as I slid out of my seat.

"Your friend's not finished," my mother admonished, and it was true: the girl was still eating her sandwich.

"Just a minute," the girl said with her mouth full. I stood there, torn between impatience and wanting to be extra-special nice and considerate. Not looking at me, she took a couple more deliberate bites, then swallowed and put down the uneaten crust.

"That was tasty," she said to my mother. "Thank you."

"What wonderful manners you have! Maybe you can give Johnny a few pointers."

The girl glanced over at me. "Okay."

Back at the dig, my excitement became tempered by dismay as I realized just how big my find was. Even as I dreamed of a femur bigger than me, I realized there was no way I could get it out of the ground myself. But I was reluctant to go to my father for help. Since he was a scientist, everyone would think *he* discovered it.

My solution was this: I would break off a big chunk of bone, give it to my father to analyze without telling him where I'd found it (the fact that he might wander into the backyard and see the gaping hole didn't occur to me), and only after he had confirmed it to be an ancient dinosaur bone and called in experts and journalists would I show them the site of my discovery.

I hit the bone so hard the clanging hurt our dog Bessie's ears, and she slunk away. Nothing happened. "It won't break," I said in frustration.

The little girl stared intently at the bone, as if trying to imagine a world eons ago. "Drop a rock on it," she said at last.

My admiration for her ballooned. I dragged a ladder out to the back and found the biggest stone in the backyard I could lift, a small boulder the size of my own head. Slowly, I lugged the stone to the top of the ladder, then unceremoniously dropped it on the bone. It made a satisfying *crack!*

After two more drops, I could see crevices on the surface. I felt bad, damaging my find like this, but I didn't see any other way to preserve my claim to discovery. I lugged the stone to the top of the ladder once more.

"Be careful," the girl warned.

This time, when the stone hit, it made a gaping hole and plunged on through. I jumped off the ladder halfway down and stared into the blackness. An awful smell—the stench of a million years—came wafting up. And then it was followed by a thick, viscous brown fluid. Yelping, I stepped back. The brown seepage bubbled out, starting to fill the hole I had dug.

“Uh-oh,” said the girl. Her brow furrowed.

My heart squeezing with fear over what I had unleashed, I abandoned my new friend and raced back to the house. I went into the bathroom to scrub my face and hands before changing my clothes.

That’s when I noticed the toilet backing up.

I was almost as thrilled to see the backhoe that excavated the broken sewer line as I would be to see any dinosaur. It too had a loud diesel roar that rattled the windows, and there was something powerful and prehistoric in the way its single arm scraped the earth.

My mother wouldn’t let me get close enough to watch, more as punishment than protection. She carried a tray of refreshments to the workmen, while from inside, I stewed, brimming with a green brew of jealousy and remorse. From that distance, I couldn’t hear any voices, but through the back window, I saw her gesture back to me, and both she and the foreman laughed uproariously.

The girl, held blameless, had been allowed to stay outside. She stood close enough that she had to cover her ears on account of the noise, but when she glanced back at the house, I saw her gleeful grin. Then her head whipped around in the other direction as a woman arrived in the backyard. With her head down, the girl walked over to her mother—I assumed that’s who she was—and buried her face against the woman’s leg. The girl’s mother shook hands with my mother, who gestured at the circus of construction in the backyard, and they too laughed together. As daughter and mother walked away, the little girl turned and waved to me, leaving me both hopelessly in love and with a sharp pang of loss.

When my mother walked back to the porch, she scraped the mud off the bottoms of her shoes. “Your father, naturally, claims to have a faculty meeting today. Since when do they have faculty meetings in the middle of summer?”

I was standing on my toes and squinting, intently watching the backhoe growl and buck as it bit into the dirt.

“Your father also failed to tell you that dinosaur bones aren’t conveniently found in backyards. You have to trek far out into the desert, where it’s hot and dry, and your camel dies, leaving you stranded. Or you have to hang off the edge

of a cliff, a thousand feet up, trying to hammer a bone out of rock. I don't like heights, Johnny, do you?"

I looked up at her. "I don't think I want to be a paleontologist," I said, enunciating the word as carefully as the girl had.

"Good boy," she said, tousling my hair.

"But what kind of scientist is dad?"

She sighed.

After dinner, my father wiped his glasses on his shirt and said, "John, come out to the lab with me. You, too, Jane."

A squat, heavy box sat on his workbench. Out of it ran thick cables, and it had a small hole about ten centimeters across.

"I can only open up the window for a few seconds at a time. Jane, with your healthy skepticism, perhaps you should look first." He threw a switch, and the box hummed, the hole beginning to glow.

"What is this?" I asked.

He smiled. "This, my children, is a window back—if my calculations are correct—to the Jurassic."

"A time machine?" Jane asked, clear incredulity in her voice.

"A time window—the largest I can make. The power required grows as the fifth power of the area." The humming grew into a brutish growl, overlaid with sounds like metal tearing. Squinting through the window, I glimpsed a sunlit riot of green, and on a distant horizon, a herd of many-horned beasts. Into the window, my father thrust a pair of large tongs and pulled out a flower, its petals a bright bloody red shot through with yellow veins. It had an awful smell—not sweet, but like rotting hamburger meat—and a huge, ugly yellow stamen almost snapped in half by the tongs. "Ah, we've reached the Cretaceous, not the Jurassic," he said. "Flowering plants." Swinging it over to Jane, he said, "Here you go, little Weena," and dropped the flower into her open hands.

She stared at it for a moment, her mouth a twisted map of shock and dismay. Then she threw it on the concrete floor of the garage and ground it under the heel of her sneakers. "It's a trick," she said. "A lie. Like Santa Claus and the Tooth Fairy." She kicked the pulpy mass under a tool cabinet.

"But Santa Claus and the Tooth Fairy are made up," our father said. "I've always been honest about them. That flower—that was proof. You won't find any plant like that today. Now I have to get another one." He pushed his glasses up to his forehead and peered at some dials. "The capacitors have to recharge—half an hour."

We trooped inside the house. My father directed us children to wash dishes. When I took too long to dry the plates, Jane splashed soapy water onto me, and I cried. My father sent Jane stomping up to her room, and shooing me aside, took command of the sink.

Unwatched, I snuck back to the garage. The air around the time window's massive capacitors, each the size of a gallon-sized milk carton, was taut, shimmering. I threw the switch. Again the machine began to hum, low at first, then increasing in volume and pitch, just short of a squeal. The time window, which had been empty and dark, glowed like the innermost blue of a candle flame. I leaned close to the window, blinking against the sudden brightness, and for a moment I again caught a glimpse of a green landscape. I grabbed the tongs.

Suddenly, a shadow blocked the window. A huge eye, yellow and saurian, peered out at me.

With a panicked yelp, I shoved the tongs through the window, provoking an anguished roar. I dropped the tongs, letting them bang against the edges of the window. Blue sparks danced. The tongs clattered to the floor, bent by the shorn edge of a hole in time and space.

Without warning, the tip of a huge black claw poked through the time window. My heart squeezed, and I jumped back, peeing my pants. The claw filled the time window and pressed against the edges, causing more sparks and a foul, burning scent. The interior of the machine began to glow a demonic red, and a cry of pain came through the window. Then the machine burst into flames. The humming abruptly broke off, and all the lights blinked out. The claw tip, now a lump of sizzling charcoal, fell to the floor.

The garage door burst open, and by the jack-o'-lantern light of the flames, my father raced to the fire extinguisher our mother had made him install in the lab. A few quick puffs of white smothered the fire, plunging us into complete darkness. I heard a crunch as my father stepped on the carbonized remnant of the claw.

Then all was silent, until my mother's voice came from within the house: "Alan? Alan! What the hell have you done now?"

A week later, when I was no longer grounded, I asked my mother if I could invite over the girl I'd discovered in the backyard. I assumed my mother, who knew everything, could contact the girl's family.

My mother said gently, "I'm sorry, Johnny, they moved away. That's why your little friend was hiding out in our backyard. She didn't want to go."

In the garage, which stank of burnt electrolytic paste, all I found was coarse black powder where my father had stepped on the fried dinosaur claw. On hands and knees, I hunted for the flower Jane had pulverized and kicked under the tool cabinet, but spotted nothing, save for a single yellow speck that could have been Mesozoic pollen. When I breathed out, the speck of maybe-pollen whirled away, and I couldn't find it again, any more than I could find that little blonde girl who wasn't lost.

Sometimes at night, I dreamed about her and her wide green eyes. Other times, I dreamed about the dinosaurs, crowding in the dark around my bed. They muttered threats for digging up their bones, for poking their eyes, for shearing off their beautiful sharp claws. "We'll get you," those terrible lizards promised. "We'll have our revenge. We've had millions of years to dream up all sorts of ways to make your life miserable and lonely."

A couple of years later, my mother sent me to a therapist, briefly, whom I told about the dinosaurs. He nodded and said those dinosaurs were a way for my mind to address the traumas of childhood. But I noticed that behind his thick glasses, his eyes looked vaguely yellow and saurian, and his ill-fitting clothes could have easily concealed a twitching tail. I decided *he* was a dinosaur, too, and I refused to see him again.

Now that you've asked about my life story, I am digging away at my memories, to recreate, like a diorama in a museum, a history. My history. To answer you, I've become a paleontologist once more.

The Assassin Neutrino

It was the smallest of things, or so my father said. But it took away the biggest thing in my world.

In my memory, my childhood summers run together, because the plots were all the same. I went barefoot for weeks, collected bugs and odd rocks, lived out centuries in imaginary worlds, and lay under the backyard trees, eating plums and orange soda floats. I seldom played with friends, because I was an odd child who didn't have many. Following me around loyally was the only friend I needed: our old mutt, Bessie.

If I fell and skinned my knee, my father lectured me on balance and caution—this coming from a man who kept a chunk of pitchblende on his desk, a man who tested electrical connections with a wet finger. If I went to my mother, she'd lean out of her chaise lounge and pour out a bit of her drink onto it, saying, "There, that should sterilize it." But if I went to our dog, Bessie, she licked my face. And when I was lonely or sullen or crying, her wet red tongue washed me all over with love.

Early in the summer between—I think—first and second grade, Bessie lost her appetite. When I poured out her kibble, she turned her nose away. I ate a few to show her it was good, but she just looked at me, unconvinced. So, at dinner, as my father talked about his latest experiments and my sister begged to go to her friend Lucy's house, I dropped a piece of gristly meat on the floor. Normally, fallen food was immediately snatched up. But Bessie, panting on the linoleum, merely sniffed it, then left it in its splash of oily gravy.

A day later, I tried to push some kibble into her mouth, but she clamped her jaw tight. And at night, Bessie had trouble sleeping. She shifted restlessly, unable to get comfortable, and she wheezed, the air rumbling in and out of her like a freight train.

Fear and guilt drove me to my father at his lab bench in the garage.

"Do you want something, John?" he asked without turning from his experiment.

I shook my head, then burst into tears.

"Did you hurt yourself? Did your mother say something to you?"

“Bessie... Bessie won’t eat,” I got out between sobs. “Something’s wrong!”

My father whistled for Bessie. She trotted in wearily, and she took it stoically as he poked at her gut. “Hmm...” He lifted her onto a table and wheeled over some massive equipment. I patted Bessie on her head as she looked at me, her eyes black as night.

“John, stand away. I’m taking some x-rays. It could hurt you.”

“Then won’t it hurt Bessie?”

“Hmm... If Bessie is really sick, the danger from illness outweighs the danger from x-rays. Do you understand?”

I didn’t, but nonetheless, I backed away. There was a humming sound and a series of sharp thumps, with the acrid tang of ozone.

That afternoon, my father found me and Bessie out under a ginkgo tree, hiding from the summer heat. He had an intense look on his face—one that normally meant he was happy. I thought this meant good news. “Is Bessie going to be okay?”

“Can you show me exactly where she sleeps?”

We all went into my room. I lay down on my bed, and Bessie curled into a comma on the floor next to me.

“Hmm...” my father said, looking down at the floor and then up at the ceiling. With his fingers, he seemed to draw lines in the air.

“Come with me,” he finally said.

We climbed into the attic. Crouched beneath the eaves of the roof, he pushed aside one of the heavy boxes that contained my grandfather’s crumbling butterfly collection and pointed out long, flat sheets of plastic he had wrapped in aluminum foil. Through a mesh-covered vent, we could see into the backyard, where he had strung up similar sheets between trees.

“You don’t know this, but right now, there are cosmic rays from outer space raining down upon us. These detect them.”

My father built things. To my mother’s despair, he never fixed anything useful, like the lawnmower or the toilet or the stove, but he had built his own x-ray machine, his own radio telescope, his own gene sequencer.

“Cosmic rays are high-energy protons traveling across the galaxy. Most of the time, they pass harmlessly through us. But sometimes when the cosmic rays strike an atom, they create a neutrino. Do you know what a neutrino is? A neutrino is a kind of subatomic particle. It’s quite important, and yet it’s like a ghost, difficult to detect, able to travel through thousands of miles of rock or metal and not be stopped. A neutrino could pass all the way from the far side of the Earth and come up at our feet.”

We clambered out of the attic. “I checked through my records, and about a year ago, there was an event,” he said. “There was no incoming track from the

attic, so it must have been a neutrino, but there was an upward spall of charged particles. And the nexus, best as I can figure, was right where Bessie sleeps beside your bed.”

Back in the garage, he picked up a black x-ray film and handed it to me. In one corner my father had scratched, *DOG, mixed breed, 11 yrs, 20 kg*. Beneath it, he had added, *Local B = 0.47 G*. I still have that x-ray film, and now, armed with my own degree in physics, I know he meant the Earth’s personal magnetic field.

In the x-ray, Bessie’s bones were a chalky white, and her soft, comforting flesh had been reduced to a pale, floury shadow. Running through her body, in spiral curves like the arms of a galaxy, were puffy clumps.

He ran a finger over the film. “See? Amazing. The tumors draw an ionization path. Even a year later, it’s quite clear. I had wondered if building my own cosmic ray detector was a bit daft—you should have heard your mother on the subject—but this ... this has paid off. It’s known that naturally occurring ionizing radiation can trigger a carcinoma, but for the first time, I can put the pieces together. I can even identify the original particle that did it, a neutrino piercing from the other side of the Earth.”

I tugged at his sleeve. “But will she be okay?”

“Who? ... Oh, the dog. I’m sorry, I’m afraid not.”

My father talked excitedly about it over dinner. Whenever he sat down with us for dinner—and whenever it occurred to my mother to make dinner—it was to lecture us about his latest project. My mother swirled her glass, the ice tumbling endlessly, while Jane and I stuck our tongues out at each other when neither parent was looking.

“It seems a little thing, but really, it’s huge,” my father said, his fork poised over his mashed potatoes. “I’m thinking of sending this to *Science*. Or maybe *Nature*.”

“Don’t make faces at your brother,” my mother said wearily.

“He started it.”

“I did not!”

“Cosmic ray research has been obsessed with the highest energies, the mysteries of the ‘knee’ and the ‘ankle,’ whereas this might nudge a return to lower energies, to...”

“To the buttocks?” my mother suggested. Jane and I giggled.

My father loaded his fork with potatoes and waved it at my mother. “People worry about radiation from x-rays and electric fields from power lines—”

“And now you’ll make them worry about cosmic rays, is that it? I can see the letters to the editor pouring in, demanding an end to cosmic radiation.”

“You can’t turn it off—”

“I know that. Jesus, Alan.” She shivered. “But you do have a way of making me feel ... well, vulnerable.” She put a hand on her stomach.

My father leaned forward. “The best thing would be to not smoke or drink.”

“You know I’ve cut back. I wish you’d stop haranguing me. It’s only when the kids get on my nerves.”

Jane looked back and forth at our parents. “What are you talking about?”

My mother and father shared a glance. “Well,” my father said slowly, “I suppose—”

“I’m having a baby,” my mother broke in. “A new brother for you two.”

“Or sister. Frankly, those tests don’t always—”

“Test schmest. It’s a boy.”

I looked down at my plate. Tracks of gravy led from a sad, indifferent clump of gray-green peas to a tensely coiled lump of fat. “Couldn’t we just fix Bessie instead?”

The day was so hot that the blue of the sky seemed bleached white. I found Bessie panting beneath a bush. She looked across the lawn, burning brown in the summer sun, as if she were looking elsewhere—as if she were looking into eternity.

I got out my red wagon with the wobbly rear wheel. Bessie didn’t have the strength to hop up into the wagon, but she had gotten so thin under her long fur that I had no trouble lifting her. My mother was asleep in her chaise lounge beneath her umbrella, her glass empty and drying in the heat.

Nowadays, children are forbidden to reconnoiter even a single suburban block. Back then, Bessie and I would tramp halfway across town without hesitation. The vet’s office was a mile away, wedged between a dry cleaner and a pizza joint. After the scratchy heat of the summer day, the lobby of the vet’s office felt cool. “My dog’s real sick,” I said.

The vet was a large, tall man with a barrel-like belly. In a small room painted bone white, he examined Bessie. “I’ll need to take an x-ray.”

I pulled out the x-ray my father had taken. The vet held it up to the light and squinted. “Where did you get this?” he asked.

“My father has a machine he built in the garage.”

Handing me back the x-ray, the vet left the room. After a while, I began to fear that he had forgotten us, but just as I was getting up, the vet came in, followed by my red-faced father.

“John, we’re going home.”

“Your dog, Professor Chant,” the vet put in. “She’s riddled with tumors—”

“I know. I doubt there’s anything you can do.” My father turned to leave.

“She’s in a great deal of pain.” The vet blocked the door, and he was even taller and wider than my father.

“I have one more x-ray to take. I can extrapolate back and confirm—”

“And your son is in pain, sir, from watching her suffer.”

My father’s shoulders slumped, and he turned and knelt by me. “Bessie’s suffered enough, John. It’s time to let her go.”

“I’ll give you a minute,” the vet said, backing out and closing the door.

“Can’t you do anything?” I asked my father. “I promise I’ll do all my chores and never complain.”

“I’m sorry, John. We have to say goodbye.”

“But you can fix anything.”

“Not this, John. Not this.”

We buried Bessie in the backyard. I cried the whole time my father dug the shallow grave, while my mother put her arms around me and kissed the top of my head. Even Jane, who had said “Yuck!” whenever Bessie licked her and who complained about dog hair around the house, laid flowers on the freshly turned earth and burst into tears.

Later, my father came into my room as I was playing on the floor. “John, do you have Bessie’s x-ray?” He walked around, lifting up books and toys. “I need it to write my paper.”

“I forgot it at the vet’s,” I lied.

He must have heard the sullen tone in my voice, for he said, “We all miss Bessie.”

I looked up at him. “Can you fix your time window? Even a little bit?” I didn’t need it to go all the way back to the Mesozoic, only a few weeks into the past. I wanted so badly to see Bessie again.

He looked uncomfortable. “I’m afraid not.” It was only years later, when I realized the risk that he taken in constructing the time window, that I understood his refusal.

He started to leave, then paused at my door. “John, you know we love you. Your mother and I, we love you so much. Our love for you is as big as a galaxy. You know what a galaxy is, don’t you?”

I nodded. He had shown me a galaxy that past winter, just after Christmas. We had looked through a telescope to see it, and even though he told me it was a vast collection of stars, I could cover it with a thumb held at arm’s length. It was both enormous and tiny, like a neutrino, like his love for me.

The next month, I found a big glass terrarium in my room. It was a pastiche of a desert, with sand and a single basaltic rock and a plastic cactus, but it also contained, splayed out like an indolent beachgoer, a thick, fat-bellied lizard, its pebbly black skin striped with pale yellow. I thought it was a rubber lizard until it flicked out a long, thin black tongue.

I jumped back, into my father, who was now standing behind me. “Do you like him?”

I pressed my face against the glass. “It’s a lizard.”

“It’s a Mexican beaded lizard, a cousin of the Gila monster. You’ll have to be careful because they have venomous fangs.” He leaned down next to me and took off his glasses to squint into the terrarium, though I knew he couldn’t see more than a few inches without corrective lenses. “What do you think?”

A few times since Bessie died, I’d had nightmares about dinosaurs. They smelled bad and came out of the toilet, and my sister laughed as they ate me. Nonetheless, it occurred to me that having one monster around to scare off the others might not be a bad thing.

My mother was less impressed. “Oh, Christ on toast, Alan, this is your worst idea ever! And there’s some competition for that spot.”

“I thought it would give him some company. Besides...” He hesitated.

“You’ve got some scheme, haven’t you?”

“Well, to be honest, John’s beaded lizard—”

“Paul,” I cut in. “His name is Paul.” During the past year, I had briefly been friends with a boy named Paul, before his mother forbade him from playing with me.

“Well, Paul has a brother,” my father said. “I was approached to take on an unusual contract—apparently I have developed a reputation for unusual experiments—”

“‘Apparently?’” my mother said, her eyebrows raised. “There’s doubt about this?”

“A colleague of mine has developed a new anti-tumor agent,” he continued, ignoring her comment. “But they had trouble with the animal experiment review board. Some activist smuggled out pictures of mice with large tumors, causing an uproar. So, I suggested the Gila monster as a subject. No one will protest experimentation on a Gila monster. But we couldn’t get any, so we got Mexican beaded lizards.” He coughed. “John’s is the control. The other is out in the lab.”

“Will they be able to visit each other?” I asked. “Maybe the one in your lab is lonely.”

“I don’t think lizards get lonely,” my father said. “Not much for affection.”

“And so, you concluded it would make a good pet for your son,” my mother said.

We went out to the garage lab, where he wheeled a terrarium containing the other beaded lizard, another lump of black and yellow in a small puddle of sand, over to a machine I recognized.

“You’re going to take an x-ray?”

“Yes, to establish a baseline. That way, when tumors develop—”

“You mean like with Bessie?”

Even my father could hear the crack of pain in my voice. “Yes. And you were very sad after she got sick and died. We don’t want that to happen, to dogs or to people.”

He explained that a tumor is tissue that grows uncontrollably. Healthy cells have instructions to be skin cells, muscle cells, kidney cells, and so on. But tumors forget their identities, and grow without direction. “Doctors have tried killing tumors with medicine,” he said, “but the drugs take a toll on healthy tissues as well. This drug is different. It restores normal instructions to the tumor, forces it to remember what kind of tissue it’s supposed to be. We’re going to try it on this lizard.”

He showed me another vial, filled with a thick pale yellow fluid, and attached a hypodermic needle. “This is transmissible sarcoma. I got it off a dead coyote I found months ago. Thought I might have use for it someday.” Putting on heavy gloves, he reached into the terrarium and pressed the lizard’s head down against the sand. With the other, he jabbed the hypodermic needle into the lizard’s thick, thrashing tail.

The lizard hissed and thrashed horribly, scattering sand. Startled, I stepped back, bumping against my father’s workbench, sending tools clattering to the concrete floor. A gluey feeling settled in my stomach as I witnessed the lizard’s distress and panic.

“It’s okay, John,” my father said. He let go of the lizard. “You know, it probably needs a name, too. You gave your lizard a name ... um, Patrick...”

“Paul,” I said. “But he’s going to die, isn’t he?”

“Well, I’m hoping the medicine will stop that.” He paused. “So, how about a name?”

I stared down at the lizard. “Fatty McStupid,” I said in barely a whisper.

My father snorted. “That’s not a very nice name. Our good thoughts matter.”

Fine words from a man who had just injected a lizard with cancer.

“Ernie,” I blurted. “Paul’s brother’s name is Ernie.”

My father leaned over the terrarium. “Hello, Ernie.” He put away the hypodermic needle, then started to pick up the tools I had scattered.

“Aren’t you going to give Ernie the, uh ... the medicine?” I asked.

Perhaps my voice was a bit plaintive, because my father stopped and looked at me.

“I want to wait a few weeks, until Ernie starts to develop tumors. But I have the medicine right here, all ready for him.” He took a heavy metal box and unlatched it. Inside were several vials, filled with a viscous fluid the color of pink bubble gum.

As he closed the box, my father said, “John, can I trust you?” I nodded. “How about I give you the chore of feeding Ernie? I have to go out of town tomorrow. You’ll feed Paul anyway, of course. That way, you can be my junior assistant. How’s that?”

Saturday, Gramma came to pick up Jane. They spent every Saturday at the local food closet, packing up and handing out groceries to needy families. As always, Gramma said to me, “You can come with us. The Lord loves a cheerful helper.”

“I, uh, was going to read,” I said lamely.

Gramma frowned. “Instead of stultifying your brain with made-up stories,” she said, “it’d do you good to see more of the real world.”

I looked down. I hated to think what she would have said had she known I was straight-out lying about reading.

From the couch, my mother called out, “Don’t worry, Johnny, the real world is overrated.”

My father had left that morning, rising in the coffee-colored predawn to fly to Washington, DC. Soon after, Jane and Gramma left, and my mother was snoring on the sofa.

I went to the bookshelves and pulled down a volume of the encyclopedia to read up on Mexican beaded lizards and Gila monsters. I was beginning to warm up to the idea of my own personal monster. If only I could trap all my terrors in a glass terrarium.

My father had forgotten to tell me what to feed Paul and Ernie. According to the encyclopedia, Gila monsters ate mice, smaller lizards, and bird eggs. So, I went into the kitchen and broke a couple of eggs into a frying pan. Between my mother's irregular cooking and Jane's frequent refusal to cook for me, I had already picked up some basic culinary skills.

I hated runny eggs, but my father loved them. The encyclopedia was not specific on how Gila monsters preferred their eggs, so I split the difference. Upstairs, I carefully slid one fried egg into the terrarium with Paul, then took the other into the garage for Ernie. After washing the pan, I found Paul desultorily chewing his egg.

"I miss Bessie," I told him. "I don't love you."

Unfazed, Paul kept chewing the egg, a bit of yolk running down his jaw.

I lay down on my bed and opened up one of my books. When I looked up, Paul's egg was all gone. When I checked in the garage, however, Ernie hadn't touched his egg. Maybe he wanted something more enticing; I didn't like fried eggs all that much myself.

After leafing through several cookbooks, I found a recipe for a Southwest omelet. *That should make him feel at home*, I thought. We didn't have all the ingredients, so I had to substitute black pepper for green pepper and mayonnaise for the sour cream, but at last, I had a nice, pseudo-Southwest omelet. Good enough for a lizard, at least.

I plopped it into the terrarium. Ernie turned his head away. My heart raced with panic. This was exactly the way Bessie had refused food when she had fallen sick. "I'm sorry I said I didn't love Paul," I told Ernie. "I didn't mean it. I love him. I love you, too." But Ernie continued his hunger strike.

I didn't want my father to come home to find Ernie dead. And my body still rang with grief for Bessie. Another death, even of a lizard... I teared up just thinking about it.

I opened the box of vials filled with pink fluid. Medicine, my father had said. A syringe as thick as a thumb lay on the workbench. After donning heavy protective gloves and standing on a step stool, I reached into the terrarium, held Ernie down, and plunged the needle in.

When I came back, I was relieved to see that both the omelet and the fried egg were gone. After school, I fried an egg for Paul and made another omelet for Ernie. Paul chewed at his egg, but Ernie pounced on the omelet as if it might run away.

Soon I was making Ernie two omelets a day. If I didn't, he scabbled horribly against the glass of his terrarium. "*I'm starving!*" he seemed to say.

When I told my mother we'd run out of eggs, she waved a hand. "There's money in my purse. You can go to the corner store by yourself, can't you?"

I hoped my father would be pleased at how responsible I'd been. True, Ernie had doubled in size and looked like a little fat man stuffed into a beaded lizard suit. He had even developed a double chin, a look which did not suit a venomous lizard.

Cooking two omelets a day was a strain. Fortunately, as Ernie got bigger, he became less fussy about what he ate. I fed him soggy cereal, stale zucchini bread, moldy cheese, and frozen blocks of leftovers I found in the back of the freezer. Despite his hearty appetite, when I went to bed and closed my eyes, I saw a cloud of tumors wheeling in the dark. Was he getting better? Was the medicine working?

I decided to x-ray Ernie. He had gotten so heavy he was hard to wrestle out of the terrarium tank. I had put on heavy gloves, which was wise, because he naughtily tried to bite me.

"Stay," I told him. But he skittered off the table, fell to the floor with a hideous *plop!* and dashed under a workbench. He wouldn't come when I called his name, so I went inside to cook a tempting omelet. But when I returned to the garage, skillet in hand, he wasn't under the workbench—and the door to the backyard was open.

My father was upset Ernie had disappeared. He asked me over and over if I knew what happened. I told my father I had fed Ernie Saturday morning, which was true, and that I hadn't seen him since, which was also more or less true.

"This experiment is important, John. Very important to me." He sighed and walked out of the room.

My sister stood in the doorway. "You're going to go to hell for lying."

"And you'll go to double hell if you tattle," I warned.

Jane frowned. "There's no such thing as double hell."

Nevertheless, I felt awful. For months, I searched for Ernie. In the backyard, some of my father's cosmic ray detectors had been gnawed on, but Ernie had moved on. I rode my bike up and down the streets and tramped through the woods behind our house. No sign of him. I imagined him lonely—as lonely as I was without Bessie. I hoped that wherever he was, he had found a home, safe from tumors and needles and whatever else might cast cold fear into the heart of a monster.

Tales from the Genetic Code

When I was in second grade, Jane and I briefly had a live-in nanny. This is how it happened.

Second grade started disastrously for me, much worse than the start of *your* second-grade year. My father gave me a chemistry set to celebrate the start of a new school year. In his enthusiasm, he accidentally started a small chemical fire that brought a fire truck to our house and landed us in the emergency room for smoke inhalation.

Missing the first day of class did not endear me to my first second-grade teacher, Mr. Yerkes, whose prime ambition was for his class to remain second-grade district champions in crippleball, a local sport that made dodgeball look kind and gentle. I had no talent for sports (and my father's explanation that humans' ability to throw accurately distinguishes us from other primates did not make me feel better), and bringing a venomous lizard for show-and-tell did not raise my status in the eyes of either Mr. Yerkes or the crippleball captain/class bully, Steve Snoever.

I then did what I thought any reasonable person would do: I tried to make an invisibility potion using my chemistry set, plus other ingredients from my father's lab. I failed to make myself unseen by Mr. Yerkes and Steve Snoever, but I did accidentally make my classroom—a permanent temporary trailer module—weirdly hard to see, like a smudge in the air. This brought both the fire department *and* the bomb squad, and after I stammered out an explanation involving “chemicals,” the decontamination unit declared the trailer module condemned—and my mother was condemned to a visit from my school's assistant vice principal.

Exhausted and exasperated after the visit, my mother stretched out on the sofa with her feet up and eyes closed, vibrating with anger. “I don't have the energy right now,” she said, feigning bored indifference with a slow drawl—not that she fooled any of us. “But I can't ignore this. So, pretend I am angry. Visualize me yelling and throwing things and, I don't know, making threats.” One hand she waved at us, and the other she curled protectively over the bump of her stomach.

“God... Don’t ask me what kind of threats. I don’t have the energy to dream up a threat. Just imagine terrible threats—the kind that give you nightmares.”

My father cleared his throat. “You know, Anne, perhaps you—”

She rattled the ice in her glass at him. “You’re not in any position to lecture me, Alan,” she snapped, and he winced, as if she had snapped him with a wet towel. “I got enough of a lecture from that man from Johnny’s school. A sweaty little man with halitosis. I swear to God, I can still smell it, like pickled fish shit. The smell must have gotten into the furniture. The assistant vice principal—I think that’s who he was—he talked at me for most of an hour. I guess when you’re an assistant vice principal, you get practice in making a short story long. And the short story is that Johnny can’t go back to that school.”

My father sat hunched over on the ottoman. I suppose he could have been more uncomfortable if he had been sitting on an ottoman of nails instead of worn red velvet, but it was unlikely.

I didn’t dare open my mouth any more than to say, “I’m sorry.” The atmosphere was so taut, I feared I might throw up.

“Oh, Johnny... I want to be angry at you, but my motherly instincts demand that I defend you. Those instincts are very annoying and very hard to ignore.” She opened her eyes. “The good news—or at least, the less bad news—is that I found a school that will take you. But it’s a half-hour drive away. In my condition, I’m not going to drive every day. I’m just not.”

My father slumped a fraction farther. “But I can’t drive him. I’m double-teaching this semester, both morning and afternoon.”

“It’s a wonder we have a son left.” She rubbed the bridge of her nose. “I can’t handle two kids on my own, not now.”

That was how Shahra came to live with us.

“You’re fat,” I blurted out when introduced to her.

“John, that’s rude,” my father snapped.

My face grew hot. I hadn’t meant to be rude. But my father always said a good scientist reported his observations, coolly and impersonally.

Shahra laughed, her black hair bobbing. “Why, John, I *am* fat! Maybe I’m as jolly as fat old Santa Claus.”

“Santa Claus is a lie,” my sister said. “A lie from the devil.”

Shahra’s right eyebrow rose. “Well, maybe not so jolly as that.”

Our father told her, “Your task is to keep track of these two.”

“Radio collars?” Shahra asked.

My father turned to my mother. “I can see why you thought of her.”

“Want to see my room?” I asked Shahra.

“I suppose I might as well figure out all your hiding places,” she said with a shrug.

First stop on the tour was the terrarium, home to my Mexican beaded lizard. “This is Paul. We used to have a dog, Bessie, but she died. I got Paul to keep me company. He had a brother, Ernie, but Ernie, um... Ernie escaped.” I decided not to go into details.

Shahra leaned forward until her nose nearly touched the glass. “The beaded lizard’s venom won’t kill you, but it would hurt like fire. You’d survive, but remember the pain, and stay away from beaded lizards.”

“My father’s going to like you,” I said.

At my new school, I met my new teacher. “You’re John Chant? I’m Mr. Tolentino.” Mr. Tolentino was also plump, like a sack of grain that had settled and bulged out at the bottom. He had thick glasses like my father, and a gentle face. Altogether, he looked like a grown-up nerd. He looked like my future.

After the bell rang and the class drifted in, Mr. Tolentino introduced me to the other kids. He handed out papers, then knelt by my desk. “It’s a math test,” he said, “but since you just arrived, it won’t count.”

“I don’t mind,” I said. “I like tests.”

The test was easy. I wrote down the answers, and when I looked up, Mr. Tolentino was still correcting some papers, and the other kids still had their heads bowed over their desks.

Bored, I used the margins of the test to make up a story based upon my answers. The first answer was 12, so I wrote, *There were once twelve knights.* The second answer was 121, so I wrote, ... *who had to fight one hundred and twenty-one monsters.* The third answer was 8: *to rescue eight princesses.*

Here I paused. In my few weeks at my former school, the only warm moment had been after show-and-tell, when a girl in my class, Becky, told me she liked my venomous lizard, Paul. Blonde with pigtails, Becky reminded me of my first crush, the girl who hadn’t been lost, the girl who had witnessed me breaking the sewer line. For that deep reason, Becky became my second crush.

In my second second-grade class, I amended my math test to read, *eight princesses all named Becky. 43. After killing forty-three of the monsters... 3. ... three of the knights had been killed.* I drew their bodies with broken monster teeth sticking out of them, adding, *and the nine remaining knights said, “If one and only one more of us is killed, then each one of us will get a Princess Becky.”*

“But if five are of us are killed,” said another knight, “then each of the remaining four of us will get two Princess Beckies.”

“That’s assuming the Princess Beckies even want to be with us,” said another knight. “They all might already have boyfriends.” The next answer was 81, so I wrote, *“They might each have eighty-one boyfriends.”*

The next morning, Mr. Tolentino handed back the tests, and as he gave me mine, he said quietly, “Can I see you at recess, John?”

My heart froze. Did he think I had cheated? Was he angry about the story and the pictures? My test didn’t have a single mark on it.

All through that first hour, I felt like I was going to throw up. When the recess bell rang and the other kids ran outside, I sat at my desk with my hands folded, ready for the firing squad.

Mr. Tolentino smiled at me. “John, I’d like for you to take another test, if you don’t mind missing recess and part of the next period.”

I started to break out in a cold sweat. “Those were my answers on the test, honest!”

Mr. Tolentino raised a palm. “Of course, John. You did very well, and the school would like to evaluate you more. I already called your mother,” he said, which put another spot of cold fear into my heart, “and she gave her permission.”

(I later found out she had said, “Oh, go ahead. His father does all kinds of tests on him. Experiments, actually.”)

He walked me down the hall to another room and opened the door. “Charlotte,” he said, “this is John. John, this is Mrs. Mullins.”

“Thank you, Henry,” she said to Mr. Tolentino. Mrs. Mullins was pretty and petite and had long brown hair, burnished to a bronze sheen, and wore bright red lipstick. If the point of the lipstick was to impress seven-year-old boys, she succeeded. Women on television wore lipstick—even street-hardened policewomen as they took down drug dealers and thieves with a flourish of the handcuffs—but my mother hardly ever did. One time my mother did put on lipstick, and I stared as if I didn’t recognize her. “Are you going to be on TV?” I asked. My mother had laughed and said, “No, we’re just going to a fancy-pants restaurant.” And it was true: my father, standing right beside her, was wearing his fanciest pants, though his mouth turned down at her remark. Later, they had left the restaurant halfway through dinner when the babysitter called them in hysterics, because my beaded lizard, Paul, had escaped, and I asked her to help me find him.

That’s why, when introduced to Mrs. Mullins, I blurted out, “Are you going to a fancy-pants restaurant?”

Mrs. Mullins said gently, “Maybe later. Right now, I’m going to be giving you a test, okay?”

The test was a lot of questions, some with words and analogies, others with numbers, and for some I had to draw a picture.

When it was over, she smiled. “Well, John, I have to add up your score, but I think I’m going to be having you in my gifted program for an hour each day. Do you have any questions?”

I raised my hand, as I had been taught. “Was that an IQ test?”

“Of a sort.”

“My father says IQ tests aren’t very good. All they measure is how good you do on IQ tests.”

“Well, your father has a point.” I noticed a smudge of lipstick on her teeth. “But we don’t have a better tool to identify gifted kids.”

I raised my hand again. “Are you going to have a baby?” She looked startled for a moment, and I added, “My mother is.”

She glanced down at her belly. “You’re a perceptive little boy, aren’t you?”

Aristotle thought the universe was layered like a wedding cake, if there were wedding cakes in ancient Greece. The bottom layer was earth, all mud and mess. Then came water, cool and sweet, and air, which gives us breath. Above that was the fire that lit our minds—some of us, at least—and uppermost, the starry firmament, ethereal and perfect, an admonishment to our muddy, human imperfections.

Our house was layered, too, though in the opposite order. The ground floor was neat and tidy, if my mother remembered to tell us kids to clean up. On the second floor were the bedrooms, where entropy had a sure foothold. My mother never bugged me about making my bed or cleaning my room. The second-floor hallway was cluttered with toys no one had played with for years. My father didn’t like the disorder, but since he himself hoarded tools and parts out in the garage, he walked around the mess as if it had been sprayed with an invisibility solution. The attic crowning the house like an outsized wig was chaos incarnate, full of unorganized boxes and gangs of mice. Sometimes I let Paul run loose in the attic. Corralled a few days later, he was full-bellied and as happy as a venomous lizard could be.

After driving me home from school, Shahra disappeared into her room, which had previously been my mother’s library, on the second floor. Soon, a smell like vinegar and nail polish remover wafted out of it.

“What are you doing?” Jane asked, having pushed open the door without a knock.

Shahra sat on the floor, surrounded by dozens of flasks of clear liquid, and in front of her was a large, flat machine, covered with lines that looked like smeared makeup. A centrifuge spun like a roulette wheel making up for years of lost bets, and next to it, a flask was shaking to a rumba beat. It reminded me of our garage.

“A little sideline I picked up,” Shahra said. “After your mom shut down her lab, I went to work for Professor Romatschke.”

“You knew our mother?” Jane asked. “From before?”

“You mean, like B.F.? ‘Before Family’? Yeah. I was a student tech in her actinide lab. She was the queen of f -valence chemistry.”

“My mother was a scientist?” I asked. “Like my father?”

Jane rolled her eyes. “You’re so *ignorant*. Of course she was!”

“Not quite like him, I don’t think,” Shahra said. “But yes, your mom was a scientist, and a drill sergeant in the lab. She gave me hell, but I sure learned a lot. Then she took maternity leave when she was pregnant with you, Jane, and I switched to biochem.”

I said to Jane, “You ruined her career.”

Jane folded her arms. “I don’t care. Science is stupid. It pretends God doesn’t exist.”

A little firecracker of laughter exploded out of Shahra. “I see. Well, little miss Jane, God exists, and so does the devil, but their names are evolution and entropy. Entropy, that’s physics, your father’s realm. But evolution shapes us and our future.” Shahra leaned in close. Her breath smelled of spearmint. “Your mom or dad ever leave a note for you?” Jane and I nodded. “Your body is made up of trillions of tiny cells—”

“My father showed us that, in his microscope,” I said.

She cleared her throat. “Inside each of those cells are tens of thousands of these little notes. They’re called—”

“DNA,” I supplied. “Do you think we’re babies?”

Shahra smiled and explained that the notes were called genes, written with DNA. Genes told our bodies how to grow and work, and how to get better when sick. “They even influence what you do and how you feel.”

I asked, “Can we read these notes?”

Shahra stood up and stretched like an oversized house cat. “I was hoping you’d ask.”

These notes, our genes, the instructions for our lives had been heavily edited over millions and millions of years, Shahra went on. But many of the crossed-out words and sentences were still there, jumbled in with our working genes.

“These crossed-out genes, they’re introns. Some people call them ‘junk DNA.’ But they aren’t junk. They make up more than ninety percent of your DNA. Professor Romatschke realized they tell us about our past and our future.”

“Like a time machine,” I said. “My father built a time machine. Well, a time window—”

“That was a fake,” Jane interrupted. “And this is a fake, too.”

Shahra raised an eyebrow. “Genetics is fake? But you have your mother’s brown eyes. You inherited her genes for that. You also inherited her caustic tongue.”

“What did *I* inherit?” I asked.

Shahra took a Q-tip out of a box and waved it like a magic wand. “Open your mouth. You haven’t been kissing anyone lately, have you? Wouldn’t want a contaminated sample.” My face reddened with embarrassment as she swabbed the inside of my cheek. Shahra then swirled the Q-tip in a test tube of clear liquid. “Professor Romatschke found she could uncover your past and your future by reading your introns. For this, she was expelled from the ivory tower.”

Jane screwed up her face. “Fortune telling? That’s the work—”

“—of the devil. I could’ve predicted you’d say that without DNA.” Shahra glanced at the test tube, then at me. “Give me a day, and I’ll tell you your history and your fate.”

The next day, Jane and I squeezed into Shahra’s room. Shahra sat shoeless on the floor. We kids stood, because all the horizontal surfaces, the desk, the windowsill, the chair, were covered with flasks and beakers and bottles of reagents. Even the floor was littered with sheets of paper, surrounding a large, flat device.

“Yesterday, I grew more of your cells and pulled out the DNA. Your DNA then got chopped up, and I added markers. Imagine taking a book and cutting out all the pages, and then looking for specific words or phrases on each page. Then this thing, it’s called an electrophoresis—”

“Lectofor...see...” I echoed.

“Ee-lect-troh-for-ee-siss,” Shahra corrected. “The markers have different weights and mobility, so I have them run a bit of a race to see what your instructions are.” She had me sit on the floor beside her, with the electrophoresis sheet between us.

“How can you read this?” I asked. “It’s just smears and shadows.”

“Good analogy, John,” Shahra said. “That’s life. Your life is written here in the book of Watson and Crick, and poor Rosalind Franklin, but smeared and

hidden by shadow and hard to read.” She tapped the paper. “Let’s see... You like a girl at school...”

Jane began singing softly, “John loves Be-cky, John loves Be-eh-cky...”

“Shut up!”

“... but that’s just more biochemical scripts running through your brain, genes whispering to you. You’ll take after your father,” she continued, “become a physicist like him. You have his gifts, his curiosity, his inventiveness. Your faults will be different. You will see beauties and monsters, and sometimes they’ll be one and the same. You’ll look at things in a way no one else has. You...” And then her voice hung up.

“What?” I asked.

Shahra pursed her lips, hesitating, the way I did when I had trouble saying a long, multisyllabic word.

“Is it about Becky? Will he marry Be-eck-ky?” Jane crooned, singing the name with a chiaroscuro of taunting.

But Shahra shook her head. “Love will elude you for a long time, and loneliness will be your companion.”

My body felt all weird and squishy when she said this. Later in life, when I remembered this, I also remembered the dig in my backyard, the girl who wasn’t lost, the saurian eye glaring at me through the time window, the smell of a burning claw—and my dream of dinosaurs standing around my bed, cursing me across the eons. Only it wasn’t a dream; it was written in my DNA.

I liked Mrs. Mullins. She was always kind and spoke gently, as if I were a glass unicorn. When she came to pick me up from Mr. Tolentino’s class, she said, “I’ve been thinking about a project to engage you with. Henry here says you like dinosaurs?”

I had mixed feelings about dinosaurs. “What, you mean like a diorama, like Suzi makes?” Suzi Chen meticulously recreated murder scenes from Sherlock Holmes novels. In fact, when Mrs. Mullins wasn’t watching, she would prick her finger with a needle and use her own blood create a puddle beneath the victim. “That looks so realistic!” Mrs. Mullins would then exclaim.

“Why, yes,” Mr. Tolentino rumbled. “I guess you could call it a *dino*-rama.”

Mrs. Mullins laughed so hard that she bumped shoulders with Mr. Tolentino.

That evening, Shahra showed us an electrophoresis sheet she had prepared from a sample of Jane’s DNA. Jane had been reluctant, but in the end, her curiosity—dictated, I suppose, by her DNA—got the better of her.

I sat across on the floor across from Shahra, bouncy with excitement, but Jane refused to sit down. She stood in the doorway with her arms crossed, straight and brittle like a dried stick. “I know you’re making this up to make fun of me,” she said. “And God.”

Shahra took out a magnifying glass and went up and down the columns of bands. “You know, this God phase of yours isn’t going to last. You will become a spectacular, messy sinner like the rest of us. You, uh, won’t be a virgin your whole life. You’ll have a mess of kids.” She leaned over to me and said in a loud stage whisper, “Living in a mobile home in a trailer park,” and I giggled.

Jane’s face twisted up. “Eww.” Then she looked over at me. “Let’s see if *she* will do it.”

By “she,” Jane meant our mother.

“Oh ... my ... God,” my mother said after Jane rambled on incoherently. “Shahrazad Sattari, what are you up to? This isn’t Esme’s ‘genomancy,’ is it?”

“Well, yeah. But just for entertainment.”

“That’s what Esme said—at first. Then she started to believe her own ravings. She wrote to the CIA and the Pentagon and the White House and CBS news and God knows who else. In the end, she claimed Jean Dixon was trying to poison her.”

Shahra twisted her foot on our grimy carpet, the way you might rub out a cigarette. Jane nudged me, and I held out a Q-tip swab to our mother. “Open wide.”

Shahra showed me how to spread the cells on a petri dish. A day later, we harvested them, then lysed them with a reagent to get the DNA out of the nuclei. “Like unwrapping a present on your birthday,” Shahra said. She demonstrated the reagents used to break apart the DNA, and how to add markers, short nucleotide sequences attached to polymers that would recognize and grab onto certain DNA sequences. This was spread as a thin film across Western gel paper and carefully inserted into the electrophoresis machine to draw out the bands.

“How do you know what it means?” I asked Shahra.

She showed me a small notebook crammed with sketches and notes: the configuration of bands, notations on nucleotide sequences, and interpretations. Some were straightforward: “susceptible to milk allergies” or “prone to alcoholism” or “tendency to introversion.” Others were more cryptic: “many miles for a short journey,” “after the mountain comes the valley,” and other phrases that I later wondered whether they had been cribbed directly from the *I Ching*.

We went to my mother and presented the results. “You have a will like iron, but beware, for iron rusts,” Shahra began.

“What is this, a DNA fortune cookie?”

“It gets better,” Shahra assured her. “You once ran an empire—your lab—and you will become the mother of an even greater empire.”

My mother laughed. “I’m glad to hear my children will survive childhood. The question is, will I survive theirs?”

I could see in Shahra’s eyes how she still worshipped my mother. “Yes and no.”

“Well, that sounds ominous. Also, confusing. What about Alan? He can’t miss out on the fun. Alan. Alan! Get in here. Johnny, take a sample from your father.”

My father sputtered and fussed and refused until my mother called him a no-fun, wet-as-a-pee-soaked-blanket, cold-chilling-rain-on-the-worst-parade-ever fuddy-duddy.

A day later, he was sitting on the couch, looking uncomfortable. My mother laughed. “Wish I had popcorn!”

“Let’s get this over with,” he muttered.

Shahra unfolded the electrophoresis chart on our living room carpet with a great deal of showmanship. “Let’s see. Perfect hearing. You wear corrective lenses. And yet you don’t see or hear what is right before you.”

She scanned the columns. “Oh, this is old,” she said. “Very old. Your great-to-the-forty-thousandth grandfather was a *Homo habilis*, one of the ancestors of humanity.”

My father smiled, a crinkly, wrinkly smile like the edge of an oyster shell, and just as sharp and as salty. “Okay, I’ll play along. And this ancestor, this monkey-man, was he smarter than his fellow hominids?”

Shahra shook her head. “No. He was scrawny and wheezed a lot, and the alpha males threw rocks at him. But when the alphas ventured out for food, this fellow stayed behind and screwed the females.” She glanced over at me and winked.

“I don’t think that’s an appropriate comment...”

“Lighten up, Alan,” my mother snapped. She took an ice cube out of her glass and threw it at him. “The boy didn’t understand a word she said.”

My father pursed his lips. “John understands far more than we think.”

For a while in Mrs. Mullins’s gifted class, I tried making stop-motion Super 8 movies with Tommy Dorigo. But I wanted to act out a battle between dinosaurs (part of me thought a tribute might appease them), while Tommy

wanted to dramatize Lee's victory at the second battle of Bull Run. I suggested a compromise: replace the Union troops with plastic dinosaurs. When we both started crying, Mrs. Mullins separated us.

"Here's another suggestion for you, John. I know your father is a scientist—"

"My mother, too."

"—and since there's a science fair in a few months, I was thinking that would be a good activity for you. But no chemistry."

"How about, um, biology?" I asked.

The next day, when I came in from morning recess, Mrs. Mullins was wiping something off of Mr. Tolentino's face. "Can I take sample from both of you?" I asked. "For my science project."

Mr. Tolentino and Mrs. Mullins exchanged a smile. "Sure, John," Mr. Tolentino said. "Anything for science."

I swabbed samples from inside their cheeks, then followed Mrs. Mullins to her classroom. From each kid, I took samples, except for Tommy, who shrank in fear when I brandished a Q-tip at him.

I spent a happy afternoon isolating the DNA and running electrophoresis gels, admittedly with Shahra carefully guiding and correcting me. My father kept stopping by the door to Shahra's room to watch. "Well, at least I guess it's good lab skills," he said several times.

"Problem, Mr. Chant?" Shahra asked. She knew using "mister" rather than "professor" or "doctor" irritated him.

My father frowned. "Well, it's cargo cult science. It's got all the forms and fetishes of science: the test tubes, the reagents, the charts and notes. But it's like building an airplane out of bamboo and palm leaves and expecting it to fly, to bring back trade goods. There's no real content."

"There's more content here than you'll let yourself see."

"Hmm," my father said noncommittally.

When Shahra dropped me off at school on a crisp fall day, the trees shedding their rust-colored leaves, my arms were full of electrophoresis sheets and notes.

Mr. Tolentino said, "So, what did you find out?"

I made a show of looking at his electrophoresis sheet and consulting my notes. "Let's see... When you were young, you wanted to join the Army, but couldn't."

"That's right. I—"

"A problem with your heart. It's inconstant, it—"

"That's amazing, John!" Mr. Tolentino's eyes grew wide behind his glasses. "I have a heart murmur. This is... Wow."

At recess, I didn't even wait for Mrs. Mullins, but at the bell, ran straight to her classroom. I had all the electrophoresis sheets spread out by the time the other kids drifted in.

"I'm pleased you found something that has you so fired you up," Mrs. Mullins said. "The science fair is still weeks away."

I did the readings for the other kids. Suzi would head a huge corporation. Mikey would invent something to change people's lives. Gina would become an unsung poet, but would be happiest of all.

Mrs. Mullins said, "And what about me?"

"I didn't analyze it yet." I had produced the electrophoresis gel, but had saved reading it for last, like a big chocolate cloud dessert, in order to savor it. "I could do it right now." Even then, I liked to show off.

Spreading the gel blot on a desk and leafing through Shahra's notebook, I began to read. "You've had disappointments in life, but managed to overcome them. Your family didn't always approve of your choices." Mrs. Mullins nodded her head a fraction. "When you were young, you wanted to ... to join the Ar—"

I stopped, my stomach scrunched in anxiety. Something was wrong. I had tried so hard to not mix up anything. Quickly I scanned down the lines, pushing down my taut sense of panic. Something looked familiar. I had always had a good memory; I used to entertain my mother by reciting the *TV Guide* for her. "What's on tonight, Johnny?" she'd ask, and having read it on Sunday, I could reel off the schedule from 7:00 to 10:00 p.m., including the capsule summaries, on Thursday night.

I pulled out Mr. Tolentino's gel and laid it out next to Mrs. Mullin's, their names written in blocky letters on top. About half of the lines matched up.

A little bead of sweat trickled down from my armpits. "Uh..."

Mrs. Mullins had gone pale. She reached for the electrophoresis sheets. "I'm sorry, John, I think the baby must have ruined my sample. You'll have to throw away—"

"You've been kissing Mr. Tolentino," I said without thinking.

The other kids laughed.

Mrs. Mullins could have bluffed her way out of it. If she had laughed it off, the inevitable playground talk and lunchroom gossip would have dissipated. But the color in her face drained away as she clapped a hand to her mouth—and the whole class saw it. I was telling the truth.

I couldn't stop myself from asking the other question beating in my mind like a moth against a light. "Is the baby Mr. Tolentino's, too?"

Less than a week later, Mr. Mullins promptly initiated divorce proceedings against his wife, and also threatened to sue Mr. Tolentino and the school.

One evening, we got a long phone call after dinner. My mother listened, trying to interrupt a couple of times. "I don't see how that's his fault," she said several times. She looked over at me, but rolled her eyes. "I see," she said.

"Well, Johnny," she told me after hanging up, "looks like you're going back to your old school."

She turned to Shahra, who said, with hardly any bitterness, "Let me guess: you don't need me anymore."

My mother smiled. "You always were the quick one."

The Turing Testaments

One morning, my bedroom door banged open so hard that I thought, *He's finally done it. He's blown us all up.* I wished my father had let me sleep a few minutes more. But it was Jane in the doorway, her arms spread wide, a bird ready to fly. "It's time!" she sang out.

"For what?" I asked, but she was already gone. In my dinosaur-and-spaceship pajamas, I thundered after her and down the stairs.

Our mother clutched her rounded belly, a cannonball ready to be fired at the world, as our father steered her out the front door. "Your damn experiment can wait, Alan," she said testily.

"It *is* waiting," he said. "We're going."

"I don't think we'll make the hospital in time." But she had a smile on her face, and when she turned and said to Jane and me, "Don't burn the house down," her tone was merry. "Or turn it invisible."

"They won't get into any mischief," Gramma said.

"Oh, Ma, it was just an expression," my mother said, then added to my father, "No, the back seat. I don't think I can sit upright."

Jane and I waved as they drove down the street. It had been an indifferent winter, and the little snow we had gotten shortly after the new year had already turned to muddy slush under bright blue skies. "You get ready for school now," Gramma said.

Classes had only just resumed after the Christmas break. I was back at my first school, but in Miss Garcia's class. I saw Mr. Yerkes in the schoolyard, but he always acted as if I were invisible. Unfortunately, I was definitely not invisible to Steve Snoever, who threw red rubber balls at me whenever he got the chance. Because we were all, despite unseasonably mild temperatures, bundled up in heavy winter coats, I barely felt the blows. That day, he bounced one off my head and shouted "Ha!" in triumph. But then I overheard Becky say, "That's not very nice," which more than made up for the sting of the ball. She was still in Mr. Yerkes's class, and we hadn't spoken once since my return. But her defense of me gave my heart a lift, as if it were tied to a balloon, and in my mind, it was almost as if we were engaged—though I didn't really know what that meant.

The rest of school passed in a blur. I remember running home and being disappointed that the driveway was still empty. I remember the beans and franks we ate for dinner. I remember peppering Gramma with questions, each of which she met with “When you’re older.” I was excited and baffled, a state Jane heightened by filling my head with stories contradictory and impossible.

There must have been a phone call, but I never heard it. Instead, the sound of a car door slamming woke me. My window was full of darkness and stars. I leapt out of bed and pounded on my sister’s door. “They’re home!”

Gramma met us on the stairs. “Back to bed, both of you.”

“But...” Jane began to protest.

“I don’t want a sound out of either of you. Your mother needs the two of you to go to sleep without making a sound.”

Lying in my bed, I heard the front door open, the low rumble of my father’s voice, and Gramma’s answer. Then I heard something horrible. At first, I thought they were killing a cat—*someone* was killing a cat—until I realized it was my mother crying.

When I cracked open my door, Gramma loomed into view. “I catch you out of bed again, and I’ll give you a whipping that’ll pass down into legend.”

“But what happened?”

Her tone softened. “In the morning, Johnny. In the morning.”

My mother’s sobbing kept me awake all night. I lay in bed, too terrified to move, even when a yellow sunrise filled the window.

At last, Gramma summoned me downstairs. Jane, her hair disheveled, was already pouring herself a bowl of cornflakes. She looked up at me, startled, and a cold hand gripped my guts. I had never seen her look so frightened, and it made me frightened, too.

Another squall of wailing came through the ceiling. To say our mother cried makes her sound like a little girl who skinned her knee and dribbled a few tears. But our mother’s grief was a wild storm, waves of anguish sweeping through the house with such ferocity that the walls swayed with her sobs. I didn’t know how she kept it up.

I thought maybe something bad had happened to my father, except he drifted down the stairs, his face gray, his glasses smudged. At the kitchen table, he embraced first Jane, then me. He looked so much like a ghost that I stiffened, thinking his arms might go right through me. He opened his mouth to say something, then burst into sobs. I had never seen him sob like that, and my stomach curdled in terror to witness it.

At the dining room table, Jane had her hands folded in front of her. She said to me with all seriousness and with translucent mucus dripping from her nose,

“John, you need to pray.” When I looked quizzically at her, she said, “Pray to Jesus to save the baby.”

When she said that, it felt like the floor had vanished from beneath me, and I was falling without end.

Gramma had just stepped out of the kitchen as Jane was saying this. She went over and kissed the top of Jane’s head. “I’m sorry, dear,” Gramma said. “Jesus took the baby away.” Seeing Jane’s open mouth, she added, “Sometimes bad things have to happen. We have to trust that Jesus is doing this for your family’s good.”

Jane looked lost and perplexed. Then her face completely changed. I could see something happen inside of her, like hidden clockwork. Her eyes turned to cold pebbles, and she said, “Well, Jesus sure is a goddamned asshole,” and as Gramma looked on in astonished horror, Jane ran upstairs and slammed shut her door.

There and then, Jane set aside her faith.

For three nights and three days, our mother refused to eat, refused to sleep, did nothing but cry and cry and cry. I wasn’t sure how to feel myself—sad, confused, and alone, I suppose. After another night where we were kept awake by our mother’s keening, Jane slipped into my room. We never had been easy allies, but we found ourselves with no one else to turn to.

“Do you think she would have cried like this for one of us?” she asked.

On the third day, in the late afternoon, the sobbing suddenly stopped. My heart froze mid-beat. Had my mother also choked, turned blue-gray, and died? I ran to my parents’ bedroom, but stopped before touching the doorknob. I still heard crying, but a different voice, a different pitch—a burbly gurgling.

Slowly, I pushed open the door. My father stood fiddling with his glasses beside the bed where my mother lay, her hair disheveled, her face and eyes red and puffed, but with a beatific smile on her face. In her arms, she had something swaddled in a blanket—something mewling. It was a cassette tape player, making the sounds of a baby crying. The cries sounded familiar. My father was trying to reflect my mother’s calm smile, but his face twitched as if gophers were tunneling beneath the skin.

It was his voice on the tape. His.

My mother carried the cassette player around all day long, cradling it in her arms. She tugged at her blouse, started to bare her breast—she had damp spots where

the milk leaked out—but my father intercepted her. “He, uh, he needs a special diet. Because of everything he went through. I’ll take care of that.”

“Oh, Alan,” my mother said. “You have no idea what to do with a baby. You dropped Johnny on his head, remember?”

When my mother slept, my father surreptitiously changed the batteries. I caught him out in the garage, making cooing noises into the microphone. When he saw me, he froze, then shrugged and continued by adding a little gurgle. He mashed down the stop button. “Your mother has burdens you can never understand,” he said as he wrapped the cassette player in a blanket. “She was so happy to be having another baby. She...”

He stopped, lost in thought, the way he did when contemplating an equation, and I thought he forgot I was there. After a while, he said, “Who can explain these things? This...” He waved the cassette recorder. “This will help her get through the next few days.”

Six months later, however, my mother was trying to teach the cassette tape player to sit up. “Both Jane and John were sitting up by this time. But Robbie isn’t even rolling over.” I think it was Jane who suggested the name Robbie.

My father glanced at us, aware of how closely we were following the conversation. “Should I call Dr. Rizzo for an appointment?” she continued. Rizzo was our sporadic pediatrician. I hadn’t seen him for two years.

“Er, no. Robbie is a special case, and I have a colleague, or rather, a colleague of a colleague who’s a ... well, a specialist in this special kind of special case.”

Out in his garage workshop, sitting on a stool, I watched him rig up spring-loaded limbs that would turn the cassette tape player over and make it wobble upright. My mother was delighted. Her laughter rang out bright and clear like a brass bell. She even hugged and kissed my father, right in front of Jane and me.

Her surge of happiness cheered up my father for a while, creating a positive feedback loop. He spent hours in his workshop upgrading “Robbie.” Robbie babbled nonsense syllables and responded when my mother cooed at him. Robbie’s little servo arms reached out and grabbed at things that my mother had to take away, saying with a lilt, “Oh no, not *that* for you.” And my father hummed happily as he watched my mother on the floor attending to Robbie, then went back to the lab to help Robbie “grow up.”

“Robbie was a little late in learning to walk,” my mother said later. In truth, my father had sweat blood—or maybe cerebrospinal fluid—to make Robbie’s internal gyroscope work. While everyone was relieved that her moods no longer

soaked the house like a typhoon, her chirping over Robbie began to grate on us, and my father was not pleased by my mother's expectation.

Out in the garage, my father had stacks of blueprints and schematics and piles of joints, motors, gears, and pulleys. Books and journals on robotics covered an entire table. "Walking is tough," he said, rubbing his face. He had salt-and-pepper stubble and dark bags under his eyes. "I didn't realize it until I dug into the literature. MIT, Caltech, Chicago—they've all abandoned that kind of thing and gone in on checkers. Checkers!" He groaned. "I found an article modeling upright posture and walking as a driven inverted pendulum. That I can do. But more than that, well, I don't know. He'll never be a star Little Leaguer."

"So, Robbie will be a klutz?"

"Don't call your brother that."

"He's not my—"

"Don't ever say *that*. Especially to your mother."

"But you said we should tell the truth. That science is about the truth."

He sagged. "Science, yes. But in human affairs... Not that lying is good, but sometimes..." He blew out a lungful of air. "Just don't ... don't say anything."

I was scared to say anything, and rightly so, after what happened with my grandmother, well before the cassette player could sit up or walk.

After my father gave our mother the cassette player, he did his best to keep Gramma away. He told her, "Anne needs to rest." And when my mother asked why her mother hadn't visited, he cleared his throat and told a lie—a lie as fat and pale as a maggot—about how Gramma was sick and didn't want to give whatever she had to the baby. "She still could call," my mother muttered. In fact, Gramma had been frenzied in her attempts to ring the house, but my father had disconnected the phones.

After three weeks, Gramma finally charged up the driveway and pounded on the door. "Anne? Anne, are you in there?"

"Don't answer the door," my father told us.

But Gramma persisted. Finally, my father opened the door. "Why, Ethel, were you knocking? We were all asleep." He glanced down our cul-de-sac, where our neighbors with poached-egg faces watched the old lady shouting on our porch. "Anne is still sleeping. I'll tell her you came by. I'll have her call you—though we've been having trouble with our phone line. That cold spell last week snapped a wire." My father was generally the worst liar I ever met, but this time he almost got away with it.

Unfortunately, my mother's mother was an old hen, so tough that you wouldn't cook her up and serve her to the pirate who kidnapped your family and sold them to coal mines. If she got her wish and was martyred to a pack of wild animals, they wouldn't be able to gnaw off a single limb. "Out of my way," she said as she shouldered past my father.

"Really, Ethel," my father said, racing after her, "it just about killed Anne, and the doctor says no one should bother—"

Gramma pushed past to find my mother sitting up in bed and cooing at the cassette player. My mother's face brightened. "Oh, Ma, I'm glad you came by! I thought you weren't feeling well."

Her pleasure at seeing her mother surprised me. In the past, whenever Gramma visited, my mother looked as if stomach acid were eating her from the inside. I was too young then to comprehend the chaotic dynamics, the strange push and pull of families.

Gramma stalked to the side of the bed and peered at the tape player wrapped in a blanket and gurgling. "What..." she said, "under God's good heaven, is *that*?"

I thought they had had arguments before, but I'd had no idea. The row that led to Satan being booted from heaven, the minor tiff that sparked the American Revolution, the teensy disagreements that kicked off the Thirty Years' War, the Great War, and the American and English civil wars—they had nothing on this fight. I slept peacefully only a few feet from a venomous lizard, but this fight gave me nightmares. It ended with my mother on the porch, clutching the tape player to her bosom, her face as red as a stop sign. Gramma was dead to her now. Did you hear me? *Dead*. Eventually, my mother, her face slick with tears and snot, went inside, slamming the door with a magnitude-six Richter-scale slam.

Out on the porch, my father stared down at his feet. "I don't know what you're up to, Alan," Gramma said after a silence stretched painfully thin. "I don't doubt that you love Anne, only your ability to do much about it. But hear me: the worse the lie, the worse the outcome, no matter what kindness you think you're doing her." She paused, and I thought she was going to make a long sermon of it. But she just fixed my father with a steely glare, like one of the pins my grandfather had used in his butterfly collection.

My father looked stricken. On more than one occasion, I had put my G.I. Joe action figure in the vise in the garage, pretending he had been captured by the KGB and was being tortured for nuclear secrets, and at that moment, my father looked a lot like that.

Shortly afterwards, Gramma moved east to be near her other daughter, and then she had a stroke, and I didn't see her ever again.

When I was ten years old, my mother suggested we take Robbie trick-or-treating. I went to protest to my father, but he had taken to long walks—"to blow off steam," he said.

I found Robbie in his room, watching a cartoon on TV. "What're you watching?" I asked.

Without turning, Robbie said, "I want to be a *real* boy." You wouldn't think a cassette tape player would have favorites, but he was drawn to *Pinocchio* as if by magnets.

I sighed. "Do you want to be Pinocchio?"

"Do you want to be Pinocchio?" he echoed back.

"Not me. You. Do you want to be Pinocchio? Like, for Halloween?"

"What's Halloween?"

"Halloween is when you dress up in costumes and go around and ring doorbells, and grown-ups give you candy."

"Why you dress up in costumes?" The subtleties of grammar were always tricky.

"People give you candy if you do."

"Why they give you candy?"

I changed the subject. "You could dress up like Pinocchio."

"I want to be a real boy!"

"No, you want to be Pinocchio. Then you can say, 'I want to be a real boy.'"

Jane and I gave him a long nose, a pointed hat cut out of paper, and a cricket—a rubber cockroach, really, from a novelty shop—on his shoulder. "Oh, that's so clever!" our mother said. "Let me get the camera."

She never took pictures of Jane or me in our costumes. I had dressed up as a murder victim, with a fake knife through my head. It wasn't original; at school, in Miss Brownlee's classroom, four other boys also had fake knives through their heads. Jane was in her Marxist phase (she tended to go through phases; Jesus had just been the first of many) and had dressed up as Trotsky. The scene played out as one might imagine:

US: Trick or treat!

KINDLY OLD LADY: Oh, what clever costumes! (To me) You look very scary. (To Robbie) And let me guess, you're Pinocchio! How clever. (Long pause, considering Jane) And you, dear, are...

JANE: Trotsky. Leon Trotsky.

OLD LADY: (after even longer pause) Who?

Unsurprisingly, Jane's enthusiastic explanation of Trotsky's role in the Fourth International dampened the Halloween spirit. Then it got out of hand in a different way.

ROBBIE: Trotsky. Leon Trotsky. Trotsky. Leon—

OLD LADY: Huh?

ROBBIE: I want to be a real boy!

OLD LADY: (smiling) Of course. And maybe if you're really—

ROBBIE: I want to be a real boy!

OLD LADY: —good, like Pinocchio—

ROBBIE: I want to be a real boy! (louder) I want to be a real boy! I want to be a real boy! I want to be a real boy!

OLD LADY: Is there something ... wrong?

JANE: Aren't all boys shouty like that?

Out on the street, people in costumes stared. I pulled Robbie's shirt up to yank out his batteries, and Robbie slumped. "Hold him," I said to Jane. I fumbled batteries back into Robbie, but he lay inert on the ground.

"We can't take him home like this," Jane whispered. "She's waiting. With a camera. She'd freak."

After several tries, I got the batteries into Robbie in the right order. He sat up and said, "Are we going to trick-or-treat?"

"I'm not doing this next year," Jane muttered.

My mother doted on Robbie, but even for him, her sands of patience ran out quickly. I'd overhear her say, "Not now, Robbie. I have a terrible migraine. It's like a nail being driven into my skull. Why don't you go bug your brother?"

And then came the inevitable *clump, clump, clump* up the stairs, and my bedroom door would swing open.

"Mama says go bug you."

"I have homework," I said.

"Why you have homework?"

"Because I go to school."

"Why you go to school?"

I sighed, swiveled around, and faced him. My first impulse was to pull out his batteries, but some other voice (it sounded like my father's, recorded deep inside me) said, *You need a better approach.*

I glanced over at Paul's terrarium. I remembered I needed to fetch some frozen mice to feed him. Simultaneously, an idea popped into my head.

"You know," I said, "Papa loves to experiment." *Papa* was Robbie's word, or rather, my father's word. It felt strange in my mouth.

"Why Papa loves to experiment?"

"It's his favorite thing in the whole world. And he loves little boys who experiment. Do you want him to love you?"

He whirred for a moment. "I want him to love me."

"Then you need to be in an experiment. Pull up your shirt."

I had seen my father stick a screwdriver into a recessed compartment in Robbie. Now I poked open that compartment and spotted a set of small dials all in a row, like buttons on a shirt, only labeled with letters: E, X, S, I, and C.

"Let's see what happens when we do this. Don't tell anyone." Taking my own screwdriver, a Christmas gift, I turned the X dial to the right, pulled down his shirt, and pushed him out of my room.

Later that evening, as he watched TV in his room, Robbie cried out in fear. I heard my mother stride down the second-floor hallway, calling, "What is it, sweetie?" I poked out of my own room and followed her into Robbie's.

Robbie cowered and pointed at the TV. "The bad person, the bad person!"

"Maybe you've had enough TV for today," she said, reaching for the switch.

"No, no, *no!*" Robbie shouted.

"My, we're having a temper tantrum today, aren't we?"

He shook his head and flung himself on the floor. When she picked him up, he screamed and kicked, connecting with her shin and making her swear. Robbie, of course, only repeated the profanity. It took quite a struggle to get him into his bed.

My mother closed the door and wiped at the perspiration on her forehead. "Do you know what's going on with Robbie?" She sighed. "Let me get your father."

As she headed downstairs, I snatched up my screwdriver and turned the X dial in the other direction. Then I made a breathless sprint back to my room, where I picked up a book.

My mother clumped upstairs. "Your father is off again on one of his walks. Robbie? You feeling calmer now?"

My reading was interrupted by my mother shouting. "Robbie? *Robbie!*"

I ran to Robbie's room. My mother was shaking him, an inert compilation of metal and plastic. She turned to me, wild-eyed, her hair flying. "Something's wrong!"

"I think he's sleeping," I said.

"Don't argue!"

As she flew out of Robbie's room, I rolled him over. The X dial was still turned up; I'd accidentally turned E down to its lowest setting. I reset both dials to the middle and was rewarded by the familiar whirr of Robbie's gears.

"He's awake!" I called out. "Robbie's awake now."

She ran back into Robbie's room to scoop him up in her arms. "I was so worried about you!" She cradled him, swinging him around the room in a slow, tender waltz. "I thought I'd lost you," she whispered. "I was so afraid I'd lost you."

I decided to be systematic, and in a notebook, I wrote the letters *E*, *X*, *S*, *I*, and *C*. *E*, I decided, stood for *energy*. Through my experiments, some of which alarmed my mother, I worked out that *X* equaled *excitability*. Next, I turned up the *C* dial. Robbie then got hold of a screwdriver, disassembling the oven and half the refrigerator, and my mother found him on the kitchen floor, surrounded by screws and nuts and coils of freon tubing. I wrote, *C = curiosity*.

"Maybe this is our reward for skipping his terrible twos," my mother said over dinner that evening. She glanced at Jane and me. "You both were awful at that age. I was tempted to give you away to a zoo. But Robbie has been so placid, I thought I had dodged a bullet." She fiddled with her glass. "Now he's making up for it with a vengeance."

My father pushed himself away from the table.

"You haven't finished your dinner," Jane said. "That's the rule."

"Different rules for grown-ups," my father said. "I'm going for a walk."

Later that same evening, Jane came into my room and flounced onto my bed. "I think he's having an affair," she announced.

My stomach squeezed at her words. "Him? Really? Have you tried to picture it?"

Jane made a face. "I know... Ick. Ick to the nth power. But he 'goes out for a walk' all the time now. He's not back yet, you know."

From downstairs came the sounds of our mother snoring on the couch. I pressed my face against my window. Rain lashed against the panes, and the windows of the garage laboratory were like the eyes of dead animals.

"I don't blame him," Jane said. "Why do you think I go to Lucy's so often? It's not as if I like her. Lucy and I have nothing in common. She whines about

math being hard. She likes *ponies*.” She shuddered, then pressed her face against the window. “Do you think she’s nice?”

“Who?”

“The other woman. The one he’s having an affair with.” Jane did have the ability to spin a whole tapestry of narrative from a frayed bit of thread. I shook my head. Jane stared out into the night. “I hope she’s nice. I hope, wherever he is, he’s happy.”

I admit I got jealous of my mother’s attention to pulleys and motors wrapped around a mewling tape player. So, the next time I changed Robbie’s battery pack, I took a screwdriver and cranked both the C and E dials as far clockwise as they would go.

“What are you doing?” Robbie asked.

I gave him a tight smile.

That evening at dinner, Robbie came down from his room and stood at the table, peering at our dinners. “What is that?”

“Chains of amino acids,” I said. I thought that remark clever.

Jane frowned at her plate. “Some kind of mystery meat.”

“Beef,” our mother said. “Definitely beef.”

Jane flipped a gravy-strewn hunk on her plate. “If you say so.”

“Can I have some?” Robbie asked.

“You have a special diet,” our father said.

“Why?”

“Because you have a special digestive system.”

“Why?”

“That’s enough, Robbie,” my father snapped.

“Jesus, Alan,” my mother said. “First you treat him as if he could shatter, then you treat him with all the sensitivity of a rock.”

My father slammed his fork down on the table and glared at my mother. “You always tell me how draining the kids are. I was trying to keep a burden off you. This is the thanks I get?”

My mother reached out her hand as if to touch him, but her fingers stopped short. “I didn’t mean to sound unappreciative.”

There was the familiar scrape as my father pushed back his chair.

“Where you going?” Robbie asked.

My father paused to wipe his smudged glasses on his shirt. He spoke to the air, as if he couldn’t bring himself to look at Robbie. “A walk. Human stance and

motion are like a driven inverted pendulum.” As he grabbed his coat, I noticed how thin he’d gotten.

After the door had clicked shut, my mother looked at the three of us. “Well, who wants to watch TV?”

Late that night, as I listened to Paul scabble in his terrarium and wondered for the gajillionth time if I could work up the courage to invite Becky over to admire him, I heard the front door click open. A glance at my illuminated clock showed it was almost midnight, and I heard my father’s weary tread up the stairs.

In the morning, though, Robbie was missing.

“He’s not in the attic, and he’s not out in the garage,” my mother said. “I even looked under the house. Do you think he went into the woods?”

My father shook his head, so hard that I thought it might just unscrew entirely and fall off. “I wouldn’t panic.”

“I’m not panicking. But I don’t know where he is.”

“Jane ran away all the time, but she just went to Lucy’s house.”

“But Robbie doesn’t play with other children. You insisted. Remember?” She sank onto the couch, her face in her hands.

My father turned to me and Jane. “You two, I want you on your bikes and scouring the neighborhood.”

“But it’s raining,” Jane protested.

“What about school?” I asked.

He furrowed his brow. “School is important, but we have to find ... Robbie.” His gaze met mine, and I knew he meant, *For your mother’s sake*.

I was tired of *for your mother’s sake*, but I shrugged on a raincoat, threw my leg over the slightly-too-big ten-speed I’d gotten for my birthday, and wobbled down the street, splashing through puddles and wiping rain from my face.

I circled our block, then several blocks. At one point, Jane and I met coming from opposite directions. We stopped in the middle of the street and looked at each other. I didn’t know about Jane, but my clothes were soaked and clammy enough to make an oyster call for a towel.

“This is crazy,” she said.

“But what if she calls the police?”

We looked at each other, silently imagining that scenario, then pedaled off in opposite directions again.

By midmorning, the rain had stopped. Recess would be ending, and Miss Brownlee would be doing math. I liked correcting Miss Brownlee’s math, and I was sorry I could not be there.

Back at the house, all I found was my mother still sitting on the couch. “Has Robbie returned?” I asked. She shook her head. “You don’t need to call the police,” I said. “I’m sure we’ll find him.”

She nodded. "I know you will, Johnny."

I was getting on my bike when she called to me from the front porch. "Johnny! Wait." I waited, gripping my handlebars, as she walked down the steps. "We should find Robbie. But..." She glanced around, looking very serious. "Johnny, I have to tell you something. Something I've never told anyone."

For a moment, I thought she was going to tell me someone else was my real father. Or that she had once murdered someone. Or that she had murdered my real father.

She said, "I know about Robbie." She gave me a sad smile. "I mean, I know your father made him in the garage."

It wasn't that my heart skipped a beat, or stopped. It was as if my heart had vanished altogether, leaving a black void in my chest.

She had been a mess after the baby died, she told me, and for a long time had wanted to believe Robbie *was* real. "I thought I was hallucinating, some sort of post-partum depression." When she came back to herself, the pretense had been established. "Your father, for all his faults, did this for me. If I suddenly said, 'I know it's all been a fake,' it would crush him." She lit a cigarette. "I've grown fond of Robbie, and I get carried away at times. Families are weird," she said, shrugging. "Now, go find him. For your father."

Some miles from our house, along a heavy metal fence, I spotted a small pile beneath a tree: Robbie, curled up and motionless. I slipped in fresh batteries, and he stirred.

"What were you doing?" I asked.

"I was following Papa." Apparently his circuits hadn't been damaged by the rain. Relief tasted like the sugary electric jolt when you bite into a frosted donut.

"Did you fall asleep here?"

"I followed Papa. Why does Papa come here?" He leaned against the fence, and I followed his gaze. It was a cemetery.

Robbie led me through the rows of gravestones. He stopped in front of a modest, almost tiny marker with a single lonely date on it:

Baby Boy Chant

"Papa comes here on his walks," Robbie told me. "Why?"

"Thank God!" my mother said as I pedaled up with Robbie balanced on the handlebars. She lifted him in her arms. "Oof, you're heavier than you look! But at least you're home."

“I’m home,” Robbie said. “I’m home, I’m home, I’m home!”

She put him down, letting him run into the house as my father walked up wearily. My mother put her hand in his. “You know, Alan, he sounds just like you. He has your voice.”

Afterword

In case your interest is piqued, here is a full list of chapter titles. You may find the full version available on Amazon and other venues. The website lifelofquarks.com will have links. If you choose to go no further, I nonetheless wish you well on your reading journey.

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I, Paleontologist

The Assassin Neutrino

Tales from the Genetic Code

The Turing Testaments

Area 50 ½

My Neighbor Godzilla

The Monster Island Affair

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Fission

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Hidden Symmetries of Two Left Feet

Swing Low, Sweet Chariot of the Gods

The Dissent of Man

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