

JUNK DNA

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Life was hard in old Silicon Valley. Little Janna Gutierrez was a native Valley girl, half Vietnamese, half Latino. She had thoughtful eyes and black hair in high ponytails.

Her mother Shirley tried without success to sell California real estate. Her father Ruben plugged away inside cold, giant companies like Ctenephore and Lockheed Biological. The family lived in a charmless bungalow in the endless grid of San Jose.

Janna first learned true bitterness when her parents broke up. Tired of her hard scrabble with a lowly wetware engineer, Shirley ran off with Bang Nguyen, the glamorous owner of an online offshore casino. Dad should have worked hard to win back Mom's lost affection, but, being an engineer, he contented himself with ruining Bang. He found and exploited every unpatched hole in Bang's operating system. Bang never knew what hit him.

Despite Janna's pleas to come home, Mom stubbornly stuck by her online entrepreneur. She bolstered Bang's broken income by retailing network porn. Jaded Americans considered porn to be the commonest and most boring thing on the Internet. Hollywood glamour, however, still had a moldy cachet in the innocent Third World. Mom spent her workdays dubbing the ethnic characteristics of tribal Somalis and Baluchis onto porn stars. She found the work far more rewarding than real estate.

Mom's deviant behavior struck a damp and morbid echo in Janna's troubled soul. Janna sidestepped her anxieties by obsessively collecting Goob dolls. Designed by glittery-eyed comix freaks from Hong Kong and Tokyo, Goobs were wiggly, squeezable, pettable creatures made of trademarked Ctenephore piezoplastic. These avatars of ultra-cuteness sold off wire racks world-wide, to a generation starved for Nature. Thanks to environmental decline, kids of Janna's age had never seen authentic wildlife. So they flipped for the Goob menagerie: marmosets with butterfly wings, starfish that scuttled like earwigs, long, furry frankfurter cat-snakes.

Sometimes Janna broke her Goob toys from their mint-in-the-box condition, and dared to play with them. But she quickly learned to absorb her parents' cultural values, and to live for business buzz. Janna spent her off-school hours on the Net, pumping-and-dumping collectible Goobs to younger kids in other states.

Eventually, life in the Valley proved too much for Bang Nguyen. He pulled up the stakes in his solar-powered RV and drove away, to pursue a more lucrative career, retailing networked toilets. Janna's luckless Mom, her life reduced to ashes, scraped out a bare living marketing mailing lists to mailing list marketers.

Janna ground her way through school and made it into U.C. Berkeley. She majored in computational genomics. Janna worked hard on software for hardwiring wetware, but her career timing was off. The latest pulse of biotech start-ups had already come and gone. Janna was reduced to a bottle-scrubbing job at Triple Helix, yet another subdivision of the giant Ctenephore conglomerate.

On the social front, Janna still lacked a boyfriend. She'd studied so hard she'd been all but dateless through school and college. In her senior year she'd moved in with this cute Korean boy who was in a band. But then his mother had come to town with, unbelievably, a blushing North Korean bride for him in tow. So much the obvious advice-column weepie!

In her glum and lonely evenings, Janna played you-are-her interactives, romance stories, with a climax where she would lip-synch a triumphant, tear-jerking video. On other nights Janna would toy wistfully with her decaying Goob collection. The youth market for the dolls had evaporated with the years. Now fanatical adult collectors were trading the Goobs, stiff and dusty artifacts of their lost consumer

childhood.

And so life went for Janna Gutierrez, every dreary day on the calendar foreclosing some way out. Until the fateful September when Veruschka Zipkinova arrived from Russia, fresh out of biohazard quarantine.

The zany Zipkinova marched into Triple Helix toting a fancy briefcase with video display built into its piezoplastic skin. Veruschka was clear-eyed and firm-jawed, with black hair cut very short. She wore a formal black jogging suit with silk stripes on the legs. Her Baltic pallor was newly reddened by California sunburn. She was very thoroughly made up. Lipstick, eye shadow, nails -- the works.

She fiercely demanded a specific slate of bio-hardware and a big wad of start-up money. Janna's boss was appalled at Veruschka's archaic approach -- didn't this Russki woman get it that the New Economy was even deader than Leninism? It fell to the luckless Janna to throw Veruschka out of the building.

"You are but a tiny cog," said Veruschka, accurately summing-up Janna's cubicle. "But you are intelligent, yes, I see this in your eyes. Your boss gave me the brush-off. I did not realize Triple Helix is run by lazy morons."

"We're all quite happy here," said Janna lightly. The computer was, of course, watching her. "I wonder if we could take this conversation off-site? That's what's required, you see. For me to get you out of the way."

"Let me take you to a fine lunch at Denny's," said Veruschka with sudden enthusiasm. "I love Denny's so much! In Petersburg, our Denny's always has long lines that stretch down the street!"

Janna was touched. She gently counter-suggested a happening local coffee-shop called the Modelview Matrix. Cute musicians were known to hang out there.

With the roads screwed and power patchy, it took forever to drive anywhere in California, but at least traffic fatalities were rare, given that the average modern vehicle had the mass and speed of a golf-cart. As Janna forded the sunny moonscape of potholes, Veruschka offered her start-up pitch.

"From Russia, I bring to legendary Silicon Valley a breakthrough biotechnology! I need a local partner, Janna. Someone I can trust."

"Yeah?" said Janna.

"It's a collectible pet."

Janna said nothing, but was instantly hooked.

"In Russia, we have mastered genetic hacking," said Veruschka, "although California is the planet's legendary source of high-tech marketing."

Janna parked amid a cluster of plastic cars like colored seedpods. Inside, Janna and Veruschka fetched slices of artichoke quiche.

"So now let me show you," said Veruschka as they took a seat. She placed a potently quivering object on the tabletop. "I call him Pumpiti."

The Pumpiti was the size and shape of a Fabergé egg, pink and red, clearly biological. It was moist, jiggly, and veined like an internal organ with branching threads of yellow and purple. Janna started to touch it, then hesitated, torn between curiosity and disgust.

"It's a toy?" she asked. She tugged nervously at a fanged hairclip. It really wouldn't do to have this blob stain her lavender silk jeans.

The Pumpiti shuddered, as if sensing Janna's hovering finger. And then it oozed silently across the table, dropped off the edge, and plopped damply to the diner's checkered floor.

Veruschka smiled, slitting her cobalt-blue eyes, and leaned over to fetch her Pumpiti. She placed it on a stained paper napkin.

"All we need is venture capital!"

"Um, what's it made of?" wondered Janna.

"Pumpti's substance is human DNA!"

"Whose DNA?" asked Janna.

"Yours, mine, anyone's. The client's." Veruschka picked it up tenderly, palpating the Pumpiti with her lacquered fingertips. "This one is made of me. Once I worked at the St. Petersburg Institute of Molecular Science. My boss -- well, he was also my boyfriend...." Veruschka pursed her lips. "Wiktor's true

obsession was the junk DNA -- you know this technical phrase?"

"Trust me, Vero, I'm a genomics engineer."

"Wiktor found a way for these junk codons to express themselves. The echo from the cradle of life, evolution's roadside picnic! To express junk DNA required a new wetware reader. Wiktor called it the Universal Ribosome." She sighed. "We were so happy until the mafiya wanted the return on their funding."

"No National Science Foundation for you guys," mused Janna.

"Wiktor was supposed to tweak a cabbage plant to make opium for the criminals -- but we were both so busy growing our dear Pumpiti. Wiktor used my DNA, you see. I was smart and saved the data before the Uzbeks smashed up our lab. Now I'm over here with you, Janna, and we will start a great industry of personal pets! Wiktor's hero fate was not in vain. And--"

Janna found Veruschka's grand Russian vision of user-based genomic petware infectious. Despite her natural skepticism, real hope began to dawn. The old Valley dreams had always been the best ones.

What an old-skool, stylin', totally trippy way for Janna to shed her grind-it-out worklife! She and Veruschka Zipkinova would create a start-up, launch the IPO and retire by thirty! Then Janna could escape her life-draining servitude and focus on life's real rewards. Take up oil-painting, go on a safari, and hook up with some sweet guy who understood her. A guy she could really talk to. Not an engineer, and especially not a musician.

Veruschka pitchforked a glob of quiche past her pointed teeth. For her pilgrimage to the source of the world's largest legal creation of wealth in history, the Russian girl hadn't forgotten to pack her appetite.

"Pumpti still needs little bit of, what you say here, tweaking," said Veruschka. The prototype Pumpiti sat shivering on its paper napkin. The thing had gone all goose-bumpy, and the bumps were warty: the warts had smaller warts upon them, topped by teensy wartlets with fine, waving hairs. Not exactly a magnet for shoppers.

Stuffed with alfalfa sprouts, Janna put her cutlery aside. Veruschka plucked up Janna's dirty fork, and enthusiastically sucked it clean. She even scratched inside her cheek with the tines.

Janna watched this dubious stunt and decided to stick to business. "How about patents?"

"No one ever inspects Russian gene labs," said Veruschka with a glittery wink. "We Russians are the great world innovators in black market wetware. Our fetal stem cell research, especially rich and good. Plenty of fetus meat in Russia, cheap and easy, all you need! Nothing ever gets patented. To patent is to teach stupid people to copy!"

"Well, do you have a local lab facility?" pressed Janna.

"I have better," said Veruschka, nuzzling her Pumpiti. "I have pumptose. The super enzyme of exponential autocatalysis!"

"Pumptose, huh? And that means?" prompted Janna.

"It means the faster it grows, the faster it grows!"

Janna finally reached out and delicately touched the Pumpiti. Its surface wasn't wet after all, just shiny like super-slick plastic. But -- a pet? It seemed more like something little boys would buy to gross-out their sisters. "It's not exactly cuddly," said Janna.

"Just wait till you have your own Pumpiti," said Veruschka with a knowing smile.

"But where's the soft hair and big eyes? That thing's got all the shelf appeal of a scabby knee!"

"It's nice to nibble a scab," said Veruschka softly. She cradled her Pumpiti, leaned in to sniff it, then showed her strong teeth and nipped off a bit of it.

"God, Veruschka," said Janna, putting down her coffee.

"Your own Pumpiti," said Veruschka, smacking, "you are loving him like pretty new shoes. But so much closer and personal! Because Pumpiti is you, and you are Pumpiti."

Janna sat in wonderment. Then, deep within her soul, a magic casement opened. "Here's how we'll work it!" she exclaimed. "We give away Pumpiti pets almost free. We'll make our money selling rip-off Pumpiti-care products and accessories!"

Veruschka nodded, eyes shining. "If we're business partners now, can you find me a place to sleep?"

Janna let Veruschka stay in the spare room at her dad's house. Inertia and lack of capital had kept Janna at home after college.

Ruben Gutierrez was a big, soft man with a failing spine, carpal-tunnel and short, bio-bleached hair he wore moussed into a hedgehog's spikes. He had a permanent mirthless grin, the side effect of his daily diet of antidepressants.

Dad's tranquil haze broke with the arrival of Veruschka, who definitely livened up the place with her go-go arsenal of fishnet tights and scoop-necked Lycra tops. With Veruschka around, the TV blared constantly and there was always an open bottle of liquor. Every night the little trio stayed up late, boozing, having schmaltzy confessions, and engaging in long, earnest sophomore discussions about the meaning of life.

Veruschka's contagious warm-heartedness and her easy acceptance of human failing was a tonic for the Gutierrez household. It took Veruschka mere days to worm out the surprising fact that Ruben Gutierrez had a stash of half a million bucks accrued from clever games with his stock options. He'd never breathed a word of this to Shirley or to Janna.

Emotionally alive for the first time in years, Dad offered his hoard of retirement cash for Veruschka's long-shot crusade. Janna followed suit by getting on the Web and selling off her entire Goob collection. When Janna's web money arrived freshly laundered, Dad bought in, and two days later, Janna finally left home, hopefully for good. Company ownership was a three-way split between Veruschka, Janna, and Janna's dad. Veruschka supplied no cash funding, because she had the intellectual property.

Janna located their Pumpti start-up in San Francisco. They engaged the services of an online lawyer, a virtual realtor, and a genomics supply house, and began to build the buzz that, somehow, was bound to bring them major-league venture capital.

Their new HQ was a gray stone structure of columns, arches, and spandrels, the stone decorated with explosive graffiti scrawls. The many defunct banks of San Francisco made spectacular dives for the city's genomics start-ups. Veruschka incorporated their business as "Magic Pumpkin, Inc.," and lined up a three-month lease.

San Francisco had weathered so many gold rushes that its real estate values had become permanently bipolar. Provisionary millionaires and drug-addled derelicts shared the very same neighborhoods, the same painted-lady Victorians, the same flophouses and anarchist bookstores. Sometimes millionaires and lunatics even roomed together. Sometimes they were the very same person.

Enthusiastic cops spewing pepper gas chased the last downmarket squatters from Janna's derelict bank. To her intense embarrassment, Janna recognized one of the squatter refugees as a former Berkeley classmate named Kelso. Kelso was sitting on the sidewalk amidst his tattered Navajo blankets and a damp-spotted cardboard box of kitchen gear. Hard to believe he'd planned to be a lawyer.

"I'm so sorry, Kelso," Janna told him, wringing her hands. "My Russian friend and I are doing this genomics start-up? I feel like such a gross, rough-shod newbie."

"Oh, you'll be part of the porridge soon enough," said Kelso. He wore a big sexy necklace of shiny junked cell-phones. "Just hang with me and get colorful. Want to jam over to the Museum of Digital Art tonight? They're serving calamari, and nobody cares if we sleep there."

Janna shyly confided a bit about her business plans.

"I bet you're gonna be bigger than Pokémon," said Kelso. "I'd always wanted to hook up with you, but I was busy with my pre-law program and then you got into that pod thing with that Korean musician. What happened to him?"

"His mother found him a wife with a dowry from Pyongyang," said Janna. "It was so lovelorn."

"I've had dreams and visions about you, Janna," said Kelso softly. "And now here you are."

"How sweet. I wish we hadn't had you evicted."

"The wheel of fortune, Janna. It never stops."

As if on cue, a delivery truck blocked the street, causing grave annoyance to the local bike messengers. Janna signed for the tight-packed contents of her new office.

"Busy, busy," Janna told Kelso, now more than ready for him to go away. "Be sure and watch our web page. Pumpiti dot-bio. You don't want to miss our IPO."

"Who's your venture angel?"

Janna shook her head. "That would be confidential."

"You don't have one, then." Kelso pulled his blanket over his grimy shoulders. "And boy, will you ever need one. You ever heard of Revel Pullen of the Ctenephore Industry Group?"

"Ctenephore?" Janna scoffed. "They're just the biggest piezoplastic outfit on the planet, that's all! My dad used to work for them. And so did I, now that I think about it."

"How about Tug Mesoglea, Ctenephore's Chief Scientist? I don't mean to name-drop here, but I happen to know Dr. Tug personally."

Janna recognized the names, but there was no way Kelso could really know such heavy players. However, he was cute and he said he'd dreamed about her. "Bring 'em on," she said cheerfully.

"I definitely need to meet your partner," said Kelso, making the most of a self-created opportunity. Hoisting his grimy blanket, Kelso trucked boldly through the bank's great bronze-clad door.

Inside the ex-bank, Veruschka Zipkinova was setting up her own living quarters in a stony niche behind the old teller counter. Veruschka had a secondhand futon, a moldy folding-chair, and a stout refugee's suitcase. The case was crammed to brimming with the detritus of subsistence tourism: silk scarves, perfumes, stockings, and freeze-dried coffee.

After one glance at Kelso, Veruschka yanked a handgun from her purse. "Out of my house, *rechniki!* No room and board for you here, *maphiya bezprizorniki!*"

"I'm cool, I'm cool," said Kelso, backpedaling. Then he made a run for it. Janna let him go. He'd be back.

Veruschka hid her handgun with a smirk of satisfaction. "So much good progress already! At last we command the means of production! Today we will make your own Pumpiti."

They unpacked the boxed UPS deliveries. "You make ready that crib vat," said Veruschka. Janna knew the drill; she'd done this kind of work at Triple Helix. She got a wetware crib vat properly filled with base-pairs and warmed it up to standard operating temperature. She turned the valves on the bovine growth serum, and a pink threading began to fill the blood-warm fluid.

Veruschka plugged together the components of an Applied Biosystems oligosynthesis machine. She primed it with a data-stuffed S-cube that she'd rooted out of the twine-tied plastic suitcase.

"In Petersburg, we have unique views of DNA," said Veruschka, pulling on her ladylike data gloves and staring into the synthesizer's screen. Her fingers twitched methodically, nudging virtual molecules. "Alan Turing, you know of him?"

"Sure, the Universal Turing Machine," Janna core-dumped. "Foundations of Computer Science. Breaking the Enigma code. Reaction-diffusion rules; Turing wrote a paper to derive the shapes of patches on brindle cows. He killed himself with a poison apple. Alan Turing was Snow White, Queen and Prince all at once!"

"I don't want to get too technical for your limited mathematical background," Veruschka hedged.

"You're about to tell me that Alan Turing anticipated the notion of DNA as a program tape that's read by ribosomes. And I'm not gonna be surprised."

"One step further," coaxed Veruschka. "Since the human body uses one kind of ribosome, why not replace that with another? The Universal Ribosome -- it reads in its program as well as its data before it begins to act. All from that good junk DNA, yes Janna? And what is junk? Your bottom drawer? My garbage can? Your capitalist attic, and my start-up garage!"

"Normal ribosomes skip right over the junk DNA," said Janna. "It's supposed to be meaningless to the modern genome. Junk DNA is just scribbled-over things. Like the crossed-out numbers in an address book. A palimpsest. Junk DNA is the half-erased traces of the original codes -- from long before humanity."

"From before, and -- maybe *after*, Wiktor was always saying." Veruschka glove-tapped at a long-chain molecule on the screen. "There is pumptose!" The gaudy molecule had seven stubby arms,

each of them a tightly wound mass of smaller tendrils. She barked out a command in Russian. The S-cube-enhanced Applied Biosystems unit understood, and an amber bead of oily, fragrant liquid oozed from the output port. Veruschka neatly caught the droplet in a glass pipette.

Then she transferred it to the crib vat which Janna had prepared. The liquid shuddered and roiled, jolly as the gut of Santa Claus.

"That pumptose is rockin' it," said Janna, marveling at the churning rainbow oil-slick.

"We going good now, girl," winked Veruschka. She opened her purse and tossed her own Pumpti into the vat. "A special bath-treat for my Pumpti," she said. Then, with a painful wince, she dug one of her long fingernails into the lining of her mouth.

"Yow," said Janna.

"Oh, it feels so good to pop him loose," said Veruschka indistinctly. "Look at him."

Nestled in the palm of Veruschka's hand was a lentil-shaped little pink thing. A brand-new Pumpti. "That's your own genetics from your dirty fork at the diner," said Veruschka. "All coated with trilobite bile, or some other decoding from your junk DNA." She dropped the bean into the vat.

"This is starting to seem a little bent, Veruschka."

"Well... you never smelled your own little Pumpti. Or tasted him. How could you not bite him and chew him and grow a new scrap in your mouth? The sweet little Pumpti, you just want to eat him all up!"

Soon a stippling of bumps had formed on the tiny scrap of flesh. Soft little pimples, twenty or a hundred of them. The lump cratered at the top, getting thicker all around. It formed a dent and invaginated like a sea-squirt. It began pumping itself around in circles, swimming in the murky fluids. Stubby limbs formed momentarily, then faded into an undulating skirt like the mantle of a cuttlefish.

Veruschka's old Pumpti was the size of a grapefruit, and the new one was the size of a golf ball. The two critters rooted around the tank's bottom like rats looking for a drain hole.

Veruschka rolled up her sleeve and plunged her bare arm into the big vat's slimy fluids. She held up the larger Pumpti; it was flipping around like a beached fish. Veruschka brought the thing to her face and nuzzled it.

It took Janna a couple of tries to fish her own Pumpti out of the vat, as each time she touched the slimy thing she had to give a little scream and let it go. But finally she had the Pumpti in her grip. It shaped itself to her touch and took on the wet, innocent gleam of a big wad of pink bubblegum.

"Smell it," urged Veruschka.

And, Lord yes, the Pumpti did smell good. Sweet and powdery, like clean towels after a nice hot bath, like a lawn of flowers on a summer morn, like a new dress. Janna smoothed it against her face, so smooth and soft. How could she have thought her Pumpti was gnarly?

"Now you must squeeze him to make him better," said Veruschka, vigorously mashing her Pumpti in her hands. "Knead, knead, knead! The Pumpti pulls skin cells from the surface of your hands, you know. Then pumptose reads more of the junk DNA and makes more good tasty proteins." She pressed her Pumpti to her cheek, and her voice went up an octave. "Getting more of that yummy yummy wetware from me, isn't he? Squeezy-squeezy Pumpti." She gave it a little kiss.

"This doesn't add up," said Janna. "Let's face it, an entire human body only has like ten grams of active DNA. But this Pumpti, it's solid DNA like a chunk of rubber, and hey, it's almost half a kilo! I mean, where's *that* at?"

"The more the better," said Veruschka patiently. "It means that very quickly Pumpti code can be recombining his code. Like a self-programming Turing machine. Wiktor often spoke of this."

"But it doesn't even look like DNA," said Janna. "There's scraps of it in all the labs at Triple Helix. I messed with that stuff every day. It looks like lint or dried snot."

"Pumpti is smooth because he's making nice old proteins from the ancient junk of the DNA. All our human predecessors from the beginning of time, amphibians, lemurs, maybe intelligent jellyfish saucers from Mars -- who knows what. But every bit is my very own junk, of my very own DNA. So stop thinking so hard, Janna. Love your Pumpti."

Janna struggled not to kiss her pink glob. The tracteries of pink and yellow lines beneath its skin were

like the veins of fine marble.

"Your Pumpti is very eager," said Veruschka, reaching for it. "Now, into the freezer! We will store it, to show our financial backers."

"What?!" said Janna. She felt a sliver of ice in her heart. "Freeze my Pumpti? Freeze your own Pumpti, Vero."

"I need mine," snapped Veruschka.

To part from her Pumpti -- something within her passionately rebelled. In a dizzying moment of raw devotion Janna suddenly found herself sinking her teeth into the unresisting flesh of the Pumpti. Crisp, tasty, spun cotton candy, deep-fried puffball dough, a sugared beignet. And under that a salty, slightly painful flavor -- bringing back the memory of being a kid and sucking the root of a lost tooth.

"Now you understand," said Veruschka with a throaty laugh. "I was only testing you! You can keep your sweet Pumpti, safe and sound. We'll get some dirty street bum to make us a Pumpti for commercial samples. Like that stupid boy you were talking to before." Veruschka stood on tiptoe to peer out of the bank's bronze-mullioned window. "He'll be back. Men always come back when they see you making money."

Janna considered this wise assessment. Kelso was coming on pretty strong, considering that he'd never talked to her at school. "His name is Kelso," said Janna. "I went to Berkeley with him. He says he's always wanted me."

"Get some of his body fluid."

"I'm not ready for that," said Janna. "Let's just poke around in the sink for his traces." And, indeed, they quickly found a fresh hair to seed a Kelso Pumpti, nasty and testicular, suitable for freezing.

As Veruschka had predicted, Kelso himself returned before long. He made it his business to volunteer his aid and legal counsel. He even claimed that he'd broached the subject of Magic Pumpkin to Tug Mesoglea himself. However, the mysterious mogul failed to show up with his checkbook, so Magic Pumpkin took the path of viral marketing.

Veruschka had tracked down an offshore Chinese ooze farm to supply cheap culture medium. In a week, they had a few dozen Pumpti starter kits for sale. They came in a little plastic tub of pumptose-laced nutrient, all boxed up in a flashy little design that Janna had printed out in color.

Kelso had the kind of slit-eyed street smarts that came only from Berkeley law classes. He chose Fisherman's Wharf to hawk the product. Janna went along to supervise his retail effort.

It was the start of October now, a perfect fog-free day for the commercial birth of Magic Pumpkin. A visionary song of joy seemed to rise from the sparkling waters of San Francisco Bay, echoing from the sapphire dome of the California sky. Even the tourists could sense the sweetness of the occasion. They hustled cheerfully round Kelso's fold-out table, clicking away with little biochip cameras.

Kelso spun a practiced line of patter while Janna publicly adored her Pumpti. She'd decked Pumpti out in a special sailor suit, and she kept tossing him high into the air and laughing.

"Why is this woman so happy?" barked Kelso. "She's got a Pumpti. Better than a baby, better than a pet, your Pumpti is all you! Starter kits on special today for the unbelievably low price of--"

Over the course of a long morning, Kelso kept cutting the offering price of the Pumpti kits. Finally a runny-nosed little girl from Olympia, Washington, took the bait.

"How do I make one?" she wanted to know. "What choo got in that kit?" And, praise the Holy Molecule, her parents didn't drag her away, they just stood there watching their little darling shop.

The First Sale. For Janna, it was a moment to treasure forever. The little girl with her fine brown hair blowing in the warm afternoon wind, the dazedly smiling parents, Kelso's abrupt excited gestures as he explained how to seed and grow the Pumpti by planting a kiss on a scrap of Kleenex and dropping it into the kit's plastic jar. The feel of those worn dollar bills in her hand, and the parting wave of little Customer Number One. Ah, the romance of it!

Now that they'd found their price point, more sales followed. Soon, thanks to word of mouth, they began moving units from their website.

Janna's dad, who had a legalistic turn of mind, had warned them to hold off any postal or

private-carrier shipments until they had federal approval. Ruben took a sample Pumtpti before the San Jose branch office of the Genomics Control Board. He argued that, since the Pumtptis were neither self-reproducing nor infectious, they didn't fall under the strict provisions of the Human Heritage Home Security Act.

The consequent investigation made the Bay Area news shows. Then the right-wing religious crowd got in on it. An evangelist from Alameda appeared at one of the hearings -- he'd confiscated a Pumtpti from a young parishioner -- and after his impassioned testimony he tore the Pumtpti apart with pincers on the San Jose Federal Building's steps, calling the unresisting little glob the "spawn of Satan."

This was catnip for their business, of course. Magic Pumpkin's website gathered a bouquet of orders from eager early adopters.

But, paradoxically, Magic Pumpkin's flowering sales bore the slimy seeds of a smashing fiscal disaster. When an outfit started small, it didn't take much traffic to double production every week. This constant doubling brought on raging production bottlenecks and serious crimps in their cash flow. In point of fact, in pursuit of market establishment, they were losing money on each Pumtpti sold. The eventual payback from all those Pumtpti accessories was still well down the road.

Janna was bored by their practical difficulties, but she had a ball inventing high concepts for Pumtpti care products and Pumtpti collectibles. Kelso's many art-scene friends were happy to sign up. Kelso was a one-man recruiting whiz. Buoyed by his worldly success, he began to shave more often and even use deodorant. He was so pleased by his ability to sucker people into the Magic Pumpkin enterprise that he even forgot to make passes at Janna.

Every day-jobber in the start-up was quickly issued his or her own free Pumtpti. "Magic Pumpkin wants missionaries, not mercenaries," Janna announced from on high, and her growing cluster of troops cheered her on. Owning a personal Pumtpti was an item of faith in the little company -- the linchpin of their corporate culture. You couldn't place yourself in the proper frame of mind for Magic Pumpkin product development without your very own darling roly-poly.

Cynics had claimed that the male demographic would never go for Pumtptis. Why would any guy sacrifice his computer gaming time and his weekend bicycling to nurture something? But once *presented* with their own Pumtpti, men found that it filled some deep need in the masculine soul. They swelled up with competitive pride in their Pumtptis, and even became quite violent in their defense.

Janna lined up an comprehensive array of related products. First and foremost were costumes. Sailor Pumtpti, Baby Pumtpti, Pumtpti Duckling, Angel Pumtpti, Devil Pumtpti, and even a Goth Pumtpti dress-up kit with press-on tattoos. They shrugged off production to Filipina doll-clothes-makers in a sweatshop in East L.A.

Further up-market came a Pumtpti Backpack for transporting your Pumtpti in style, protecting it from urban pollution and possibly nasty bacteria. This one seemed like a sure hit, if they could swing the Chinese labor in Shenzhen and Guangdong.

The third idea, Pumtpti Energy Crackers, was a no-brainer: crisp collectible cards of munchable amino acid bases to fatten up your Pumtpti. If the crackers used the "mechanically recovered meat" common in pet food and cattle feed, then the profit margin would be primo. Kelso had a contact for this in Mexico: they guaranteed their cookies would come crisply printed with the Pumtpti name and logo.

Janna's fourth concept was downright metaphysical: a "Psychic Powers Pumtpti Training Wand." Except for occasional oozing and plopping, the Pumtptis never actually managed conventional pet tricks. But this crystal-topped gizmo could be hawked to the credulous as increasing their Pumtpti's "empathy" or "telepathy." A trial mention of this vaporware on the Pumtpti-dot-bio website brought in a torrent of excited New Age emails.

The final, sure-thing, Pumtpti accessory was tie-in books. Two of Kelso's many unemployed writer and paralegal friends set to work on the *Pumtpti User's Guide*. The firm forecast an entire *library* of guides, sucking up shelf-space at chain stores and pet stores everywhere. *The Moron's Guide to Computational Genomics. Pumtpti Tips, Tricks and Shortcuts. Backing Up Your Pumtpti. Optimize Your Pumtpti for High Performance. The Three Week Pumtpti Guide, the One Day Pumtpti Guide*

and the *Ten Minute Pumpti Guide*. The *Pumpti Bible*, with the quick-start guide, walkthrough, lists, maps and Pumpti model index. *Pumpti Security Threats: How to Protect Your Pumpti From Viral DNA Hacks, Trojan Goo Horses, and Unauthorized Genetic Access*. And more, more, more!

But moving from high-vaporware to the street proved difficult. Janna had never quite realized that manufacturing real, physical products was so much harder than just thinking them up. Magic Pumpkin failed to do its own quality control, so the company was constantly screwed by fly-by-nighters. Subcontractors were happy to take their money, but when they failed to deliver, they had Magic Pumpkin over a barrel.

The doll costumes were badly sized. The Pumpti Backpacks were ancient Hello Kitty backpacks with their logos covered by cheap paper Pumpti stickers. The crackers were dog biscuits with the stinging misprint "Pupti." The "telepathic" wand sold some units, but the people nuts enough to buy it tended to write bad checks or have invalid credit card numbers. As for the User's Guides, the manuscripts were rambling and self-indulgent, long on far-fetched jokes yet critically short on objective scientific facts.

One ugly roadblock was finally removed when the Genomics Control Board came through with their blessing. The Pumptis were deemed harmless, placed in the same schedule-category as home gene-testing kits. Magic Pumpkin was free to ship throughout the nation!

But now that their production lines were stabilized, now that their catalogs were finally proofed and printed, now that their ad campaign was finally in gear, their fifteen minutes of ballroom glamour expired. The pumpkin clock struck midnight. The public revealed its single most predictable trait: fickleness.

Instantly, without a whimper of warning, Magic Pumpkin was deader than pet rocks. They never shipped to the Midwest or the East Coast, for the folks in those distant markets were sick of hearing about the Pumptis before they ever saw one on a shelf.

Janna and Veruschka couldn't make payroll. Their lease was expiring. They were cringing for cash.

A desperate Janna took the show on the road to potential investors in Hong Kong, the toy capital of the world. She emphasized that Magic Pumpkin had just cracked the biggest single technical problem: the fact that Pumptis looked like slimy blobs. Engineering-wise, it all came down to the pumptose-based Universal Ribosome. By inserting a properly tweaked look-up string, you could get it to express the junk DNA sequences in customizable forms. Programming this gnarly cruft was, from an abstract computer-science perspective, "unfeasible," meaning that, logically speaking, such a program could never be created within the lifetime of the universe.

But Janna's dad, fretful about his investment, had done it anyway. In two weeks of inspired round-the-clock hacking, Ruben had implemented the full OpenAnimator graphics library, using a palette of previously unused rhodopsin-style proteins. A whiff of the right long-chain molecule could give your Pumpti any mesh, texture, color-map, or attitude matrix you chose. Not to mention overloaded frame-animation updates keyed into the pumptose's ribosomal time-steps! It was a techie miracle!

Dad had even flown along to Hong Kong to back Janna's pitch, but the Hong Kong crowd had no use for software jargon in American English. The overwrought Ruben killed the deal by picking fights over intellectual property -- no way to build partnerships in Hong Kong.

Flung back to San Francisco, Janna spent night after night frantically combing the Web, looking for any source of second-round venture capital, no matter how far-fetched.

Finally she cast herself sobbing into Kelso's arms. Kelso was her last hope. Kelso just had to come through for them: he had to bring in the seasoned business experts from Ctenophore, Inc., the legendary masters of jellyfish A-Life.

"Listen, babe," said Kelso practically, "I think you and the bio-Bolshevik there have already taken this concept just about as far as any sane person oughta push it. Farther, even. I mean, sure, I recruited a lot of my cyberslacker friends into your corporate cult here, and we promised them the moon and everything, so I guess we'll look a little stupid when it Enrons. They'll bitch and whine, and they'll feel all disenchanting, but come on, this is San Francisco. They're used to that here. It's genetic."

"But what about my dad? He'll lose everything! And Veruschka is my best friend. What if she shoots me?"

"I'm thinking you, me, and Mexico," said Kelso dreamily. "Way down on the Pacific coast -- that's where my mother comes from. You and me, we've been working so hard on this start-up that we never got around to the main event. Just dump those ugly Pumpkis in the Bay. We'll empty the cash box tonight, and catch a freighter blimp for the South. I got a friend who works for Air Jalisco."

It was Kelso's most attractive offer, maybe even sincere, in its way. Janna knew full well that the classic dot-com move was to grab that golden parachute and bail like crazy before the investors and employees caught on. But Magic Pumpkin was Janna's own brain-child. She was not yet a serial entrepreneur, and a boyfriend was only a boyfriend. Janna couldn't walk away from the green baize table until that last, final spin of the wheel.

It had been quite some time since Ctenophore Inc. had been a cutting edge start-up. The blazing light of media tech-hype no longer escaped their dense, compact enterprise. The firm's legendary founders, Revel Pullen and Tug Mesoglea, had collapsed in on their own reputations. Not a spark could escape their gravity. They had become twin black holes of biz weirdness.

Ctenophore's main line of business had always been piezoplastic products. Ctenophore had pumped this protean, blobject material into many crazy scenes in the California boom years. Bathtub toys, bondage clothing, industrial-sized artificial-jellyfish transport blimps -- and Goob dolls as well! GoobYoob, creator of the Goob dolls, had been one of Ctenophore's many Asian spin-offs.

As it happened, quite without Janna's awareness, Ctenophore had already taken a professional interest in the workings of Magic Pumpkin. GoobYoob's manufacturing arm, Boogosity, had been the Chinese ooze-farm supplier for Pumpki raw material. Since Boogosity had no advertising or marketing expenses, they'd done much better by the brief Pumpki craze than Magic Pumpkin itself.

Since Magic Pumpkin was going broke, Boogosity faced a production glut. They'd have to move their specialty goo factories back into the usual condoms and truck tires. Some kind of corporate allegiance seemed written in the stars.

Veruschka Zipkinova was transfixed with paranoia about Revel Pullen, Ctenophore's Chairman of the Board. Veruschka considered major American capitalists to be sinister figures -- this conviction was just in her bones, somehow -- and she was very worried about what Pullen might do to Russia's oil.

Russia's black gold was the life-blood of its pathetic, wrecked economy. Years ago Revel Pullen, inventively manic as always, had released gene-spliced bacteria into America's dwindling oil reserves. This fatal attempt to increase oil production had converted millions of barrels of oil into (as chance would have it) raw piezoplastic. Thanks to the powerful Texas lobby in Washington, none of the lawsuits or regulatory actions against Ctenophore had ever succeeded.

Janna sought to calm Veruschka's jitters. If the company hoped to survive, they had to turn Ctenophore into Magic Pumpkin's fairy godmother. The game plan was to flatter Pullen, while focusing their persuasive efforts on the technical expert of the pair. This would be Ctenophore's chief scientist, a far-famed mathematician named Tug Mesoglea.

It turned out that Kelso really did know Tug Mesoglea personally, for Mesoglea lived in a Painted Lady mansion above the Haight. During a protracted absence to the Tweetown district of Manchester (home of the Alan Turing Memorial), Tug had once hired Kelso to baby-sit his jellyfish aquarium.

Thanks to San Francisco's digital grapevine, Tug knew about the eccentric biomathematics that ran Pumpkis. Tug was fascinated, and not by the money involved. Like many mathematicians, Mesoglea considered money to be one boring, merely bookkeeping subset of the vast mental universe of general computation. He'd already blown a fortune endowing chairs in set theory, cellular automata, and higher-dimensional topology. Lately, he'd published widely on the holonomic attractor space of human dreams, producing a remarkable proof that dreams of flight were a mathematical inevitability for a certain fixed percentage of the dreams -- this fixed percentage number being none other than Feigenbaum's chaos constant, 4.6692.

Veruschka scheduled the meet at a Denny's near the Moffat Field blimp port. Veruschka had an unshakeable conviction that Denny's was a posh place to eat, and the crucial meeting had inspired her to dress to the nines.

"When do they want to have sex with us?" Veruschka fretted, paging through her laminated menu.

"Why would they want to do that?" said Janna.

"Because they are fat capitalist moguls from the West, and we are innocent young women. Evil old men with such fame and money, what else can they want of us? They will scheme to remove our clothing!"

"Well, look, Tug Mesoglea is gay." Janna looked at her friend with concern. Veruschka hadn't been sleeping properly. Stuck on the local grind of junk food and eighty-hour weeks, Veruschka's femme-fatale figure was succumbing to Valley hacker desk-spread. The poor thing barely fit in her designer knock-offs. It would be catty to cast cold water on her seduction fantasies, but really, Veruschka was swiftly becoming a kerchiefed babushka with a string-bag, the outermost shell of some cheap nest of Russian dolls.

Veruschka picked up her Pumpti, just now covered in baroque scrolls like a fin-de-siècle picture frame. "Do like this," she chirped, brushing the plump pet against her fluffy marten-fur hat. The Pumpti changed its surface texture to give an impression of hairiness, and hopped onto the crown.

"Lovely," said Veruschka, smiling into her hand mirror. But her glossy smile was tremulous.

"We simply must believe in our product," said Veruschka, pep-talking to her own mirror. She glanced up wide-eyed at Janna. "Our product is so good a fit for their core business, no? Please tell me more about them, about this Dr. Tug and Mr. Revel. Tell me the very worst. These gray haired, lecherous fat-cats, they are world-weary and cynical! Success has corrupted them and narrowed their thinking! They no longer imagine a brighter future, they merely go through the rote. Can they be trusted with our dreams?"

Janna tugged fitfully at the floppy tie she'd donned to match her dress-for-success suit. She always felt overwhelmed by Veruschka's fits of self-serving corn. "It's a biz meeting, Vero. Try to relax."

Just as the waitress brought them some food, the glass door of the Denny's yawned open with a ring and a squeak. A seamy, gray haired veteran with the battered look of a bronco-buster approached their table, with a bowlegged scuff.

"I'm Hoss Jenks, head o' security for Ctenophore." Jenks hauled out a debugging wand and a magnetometer. He then swept his tools with care over the pair of them. The wand began beeping in frenzy.

"Lemme hold on to your piece for you, ma'am," Jenks suggested placidly.

"It's just a sweet little one," Veruschka demurred, handing over a pistol.

Tug Mesoglea tripped in moments later, sunburned and querulous. The mathematician sported a lavender dress-shirt and peach-colored ascot, combined with pleated khaki trail-shorts and worn-out piezoplastic Gripper sandals.

Revel Pullen followed, wearing a black linen business suit, snakeskin boots, and a Stetson. Janna could tell there was a bald pate under that high hat. Jenks faded into a nearby booth, where he could shadow his employers and watch the door.

Mesoglea creaked into the plastic seat beside Veruschka and poured himself a coffee. "I phoned in my order from the limo. Where's my low-fat soy protein?"

"Here you go, then," said Janna, eagerly shoving him a heaped plate of pseudo-meat.

Pullen stared as Mesoglea tucked in, then fastidiously lit a smokeless cigarette. "I don't know how the hell this man eats the food in a sorry-ass chain store."

"I believe in my investments," Mesoglea said, munching. "You see, ladies, this soy protein derives from a patented Ctenophore process." He prodded at Veruschka's plate. "Did you notice that lifelike, organic individuality of your waffle product? That's no accident, darling."

"Did we make any real foldin' money off that crap?" said Revel Pullen.

"Of course we did! You remember all those sintered floating gel rafts in the giant tofu tanks in Chiba?" Mesoglea flicked a blob of molten butter from his ascot.

"Y'all don't pay no never mind to Dr. Mesoglea here," Revel counter-advised. "Today's economy is all about diversity. Pro-active investments. Buying into the next technical wave, before you get cannibalized."

Revel leered. "Now as for me, I get my finger into every techno-pie!" His lipless mouth was like a letter-slot, bent slightly upward at the corners to simulate a grin.

"Let me brief you gentlemen on our business model," said Janna warily. "It's much like your famous Goob dolls, but the hook here is that the Pumppti is made of the user's very own DNA. This leads to certain, uh, powerful consumer bonding effects, and..."

"Oh good, let's see your Pumpptis, girls," crooned Tug, with a decadent giggle. "Whip out your Pumpptis for us."

"You've never seen our product?" asked Janna.

"Tug's got a mess of 'em," said Revel. "But y'all never shipped to Texas. That's another thing I just don't get." Pullen produced a sheaf of printout, and put on his bifocals. "According to these due-diligence filings, Magic Pumpkin's projected on-line capacity additions were never remotely capable of meeting the residual in-line demand in the total off-line market that you required for breakeven." He tipped back his Stetson, his liver-spotted forehead wrinkling in disbelief. "How in green tarnation could you gals overlook that? How is that even possible?"

"Huh?" said Janna.

Revel chuckled. "Okay, now I get it. Tug, these little gals don't know how to do business. They've never been anywhere near one."

"Sure looks that way," Tug admitted. "No MBA's, no accountants? Nobody doing cost control? No speakers-to-animals in the hacker staff? I'd be pegging your background as entry-level computational genomics," he said, pointing at Janna. Then he wagged his finger at Veruschka, "And you'd be coming from -- Slavic mythology and emotional blackmail?"

Veruschka's limpid eyes went hard and blue. "I don't think I want to show you men my Pumppti."

"We kind of have to show our Pumpptis, don't we?" said Janna, an edge in her voice. "I mean, we're trying to make a deal here."

"Don't get all balky on the bailout men," added Revel, choking back a yawn of disdain. He tapped a napkin to his wrinkled lips, with a glint of diamond solitaire. He glanced at his Rolex, reached into his coat pocket and took out a little pill. "That's for high blood pressure, and I got it the hard way, out kickin' ass in the market. I got a flight back to Texas in less than two hours. So let's talk killer app, why don't we? Your toy pitch is dead in the water. But Tug says your science is unique. So the question is: where's the turnaround?"

"They're getting much prettier," Janna said, swiftly hating herself.

"Do y'all think Pumpptis might have an app in home security?"

Janna brightened. "The home market?"

"Yeah, that's right, Strategic Defense for the Home." Pullen outlined his scheme. Ever the bottom-feeder, he'd bought up most of the patents to the never-completed American missile defense system. Pullen had a long-cherished notion of retrofitting the Star Wars shield into a consumer application for troubled neighborhoods. He had a hunch that Pumpptis might meet the need.

Revel's proposal was that a sufficiently tough-minded, practical Pumppti could take a round to the guts, fall to earth, crawl back to its vat in the basement and come back hungry for more. So if bullets were fired at a private home from some drug-crazed drive-by, then a rubbery unit of the client's Pumppti Star Wars shield would instantly fling itself into the way.

Veruschka batted her eyes at Pullen. "I love to hear a strong man talk about security."

"Security always soars along with unemployment," said Pullen, nodding his head at his own wisdom. "We're in a major downturn. I seen this before, so I know the drill. Locks, bolts, Dobermans, they're all market leaders this quarter. That's Capitalism 301, girls."

"And you, Ctenephore, you would finance Magic Pumpkin as a home-defense industry?" probed Veruschka.

"Maybe," said Pullen, his sunken eyes sly. "We'd surely supply you a Washington lobbyist. New public relations. Zoning clearances. Help you write up a genuine budget for once. And of course, if we're on board, then y'all will have to dump all your crappy equipment and become a hunnert-percent Ctenephore

shop, technologically. Ctenophore sequencers, PCRs, and bioinformatic software. That's strictly for your own safety, you understand: stringent quality assurance, functional testing and all."

"Uhm, yeah," nodded Tug. "We'd get all your intellectual property copyrighted and patented straight with the World Intellectual Property Organization. The lawyer fees, we'll take care of that. Ctenophore is downright legendary for our quick response time to a market opportunity."

"We gonna help you youngsters catch the fish," said Pullen smugly. "Not just give you a damn fish. What'd be the fun in that? Self-reliance, girls. We wanna see your little outfit get up and walk, under our umbrella. You sign over your founder's stock, put in your orders for our equipment -- and we ain't gonna bill for six months -- then my men will start to shake the money tree."

"Wait, they still haven't shown us their Pumptis," said Tug, increasingly peevisish. "And, Revel, you need to choke it back to a dull roar with those Star Wars lawn jockeys. Because I can grok ballistic physics, dude, and that crap never flies." Tug muffled a body sound with his napkin. "I ate too many waffles."

Janna felt like flipping the table over into their laps. Veruschka shot her a quick, understanding glance and laid a calming hand on her shoulder. Veruschka played a deep game.