

Thumbkin, Caesar, Princess, and Troll by Mary A. Turzillo
Let no one accuse this of being a tall tale!

Thomas Maximilian Abraham Augustus Grand yearned for a woman who could hold him in the palm of her hand. No lesser consort would fulfill his dreams. His twelve centimeters would complement her meter and three quarters.

Thomas Grand, or Thumbkin, as the media later called him, was a man born before his time. His parents, Doctors Pete and Polly Grand, had wanted an astronaut's career for their son, and so conspired to conceive a baby who, at maturity, would stand only twelve centimeters tall. Future space missions, they believed, would be crewed by people who massed less than two hundred grams.

Thumbkin exceeded expectations. His body had matured fast, with fewer cell divisions, hence fewer total cells. Thanks to clever genetic engineering, a far greater proportion of his brain could be devoted to higher cognitive skills -- symbol manipulation and spatial perception. And a smaller, more neotenous brain enhanced his synaptic firing speed -- a determinant of intelligence.

But shortly after Thumbkin's twelfth birthday, public opinion turned Luddite; factory workers overran and trashed nanotech labs. In such a climate, Congress cut space and science funding to the bone. Further, existing astronauts formed unions and fought the genetic engineering of the mouse-sized astronauts who might spoil their own chances at the planets.

They only succeeded in destroying the space program. Little guys like Tom Grand would have been affordable crew on a mission to Mars; the big guys spoiled it for everybody.

Truth was, Thumbkin didn't much want to be an astronaut. He preferred inner space -- the submolecular world.

True, nanotechnology had a really bum rap, hysteria spilling over from the furor over genetically modified foods. But, following his own dream, Thumbkin enrolled in one of the rare nanotech Ph.D. programs still left in the country, at Buckeye State. His own condition was not due to nanotechnology, but a simple in-utero hormone treatment. He was lucky; his only deformities were an outsized nose, disproportionally large feet, and genitalia to match. Of the last, he never really could conduct a comparison, since he was the only man of his height in the Midwest, although several others lived in California, and one or two in east Asia.

In the lab at Buckeye, he had his problems. He always had to get his partner to lift him up to the computer or the lab table, though he petitioned for a ladder. Once level with the instruments, he scampered nimbly about, jumping from key to key to program the atomic force microscope. Once he was trapped in a chamber of self-replicating Penrose tiles, and saved his own life by hanging from the lid while the crazy quilt of polygons surged around his feet.

His professors had to read his exams with a microscope. They often tried to psychoanalyze him, saying he only went into nanotech because he'd otherwise never get to work with anything smaller than he was.

One sympathetic professor, a buxom brunette who inspired in Thumbkin a fantasy about tiptoeing along her low neckline and possibly burrowing in her cleavage, said he should try for a woman his own size. Ah, but those puny specimens (there was one finishing her master's in medieval French literature right there at Buckeye State) didn't get his juices flowing at all. He liked big women.

Several adventurous women did accept dates with him, but some embarrassing incident always sabotaged the relationship before it really blossomed. With Mindy, it was when they went to a movie and the ticket seller let them in on one ticket, not even noticing Thumbkin, who was standing on the floor beside Mindy. With Gretchen, there was that awful evening when Thumbkin

decked himself out in a Hawaiian shirt and perched on Gretchen's lapel, only to hear her mother compliment her on the cute new brooch.

In 2023, when Thumbkin was about to get his degree, the commencement speaker was a jovial billionaire named Harry P. Caesar, who had made a fortune in utilities, having speculated on fusion reactors just before they became feasible technology. Mr. Caesar made an audacious offer from the podium.

"Gentlemen, this is a time for boldness and forward thinking. Put aside the hand-wringing of the Luddites and solve three problems for me. The first man to give me answers to these burning issues will earn a controlling share of the stock in my company. Not only that, but I'll marry my daughter off to him."

A buzz of excitement rose from the graduating student body. One female graduate shouted, "What if a woman offers the answers?"

"I'll marry her myself!" crowed Caesar.

They settled back in their seats, waiting for the three problems.

"First," said Caesar, "is the problem of the slums of Great Lakes City. The poor shoot each other or die of drug overdoses. We need to give them a better life. Second, there is the problem of world hunger."

Students exchanged wary comments. Such problems were difficult, but perhaps the superior minds in the class of 2023 could overcome centuries of adversity. Caesar rapped on the podium.

"And third, my new Sebeliuswagen X-03 has a miss so bad it never reaches its peak acceleration."

Dismayed murmurs rippled through the hall. The Sibeliuswagen X-03, the most pretentious lemon ever built? Poverty and world hunger, sure, but the Sibeliuswagen?

Still, graduates swarmed up to Caesar after the ceremony. Thumbkin was able to attract his attention only by using a pair of straight pins as pitons and some buckminsterfullerene monofilament to climb up his pant leg and suit jacket, after which he buttonholed the multibillionaire. In fact, he crawled up the inside of Caesar's lapel and stuck his head through the buttonhole.

"Listen," said Thumbkin. He had a high voice, it's true, but not as squeaky as you might think. After all, a blue jay is pretty small, and you know what kind of racket they make. "I can do all that. Just give me a chance."

"Hm," said Caesar. "I see you are graduating summa cum laude. And yet, I suspect your cuteness influenced your professors to give you high grades. If none of your classmates can solve these problems, I suppose I'll give you a chance."

It was completely unfair!

Thumbkin, discouraged, trudged back to his apartment, which was on the top of his best buddy's microwave oven, and followed the antics of his classmates as they tried to earn Caesar's reward.

Gumbon Carlsbad, the class cut-up, tried to reclaim the slums of Great Lakes City by using assemblers to change all the paving materials in the poorer neighborhoods to white chocolate. He apparently believed the endorphins would assuage the anger of the unemployed and disaffected. He then passed out fifty dollar bills made by other assemblers, ones which were programmed to give each bill a different serial number. His scheme would have worked, had Caesar not been a law-abiding man. Counterfeiting is still a crime.

Millicent Kratchett, who wanted to bed Caesar rather than marry his daughter, tried introducing a retrovirus which changed all the dope in northeast Ohio to vitamin B12. The ensuing riots were particularly difficult to control because all the participants were completely lucid and out-thought the police at every turn.

The local TV gods and goddesses sneered so hatefully at Millicent and Gumbon that no more candidates were willing to try their luck. This was Thumbkin's cue.

He first put an ad in the paper calling for a collection of all firearms in the city. He promised these would be converted, by his assemblers,

into televisions with free satellite links.

When the televisions were delivered (and they were very thin, elegant ones, massing no more than the guns they had been made from), they turned out to have free Internet connections, with special search engines which, when they opened X-rated sites or chain e-mail jokes, would artfully segue into instructional material.

"I don't know," said Caesar. "They seem happy, but let's see what you can do to solve world hunger."

This proved an easier task, although it took longer. Thumbkin created a fleet of self-replicating robots to deliver what he called Mother Cupboards to the poor of the world. The cupboards themselves were self-replicating, usually creating their mass from sand or rock. Then, as a third generation replicator, each Mother Cupboard was capable of converting whatever was on hand -- dirt, weeds, used tires, discarded compact discs -- to a beans-and-rice mix that looked and tasted like pizza. Problems arose when it was discovered that a bad LDL-HDL cholesterol ratio could result from the fact that the pizza lacked omega-3 oils, but by this time many young people of Great Lakes City had gotten advanced degrees in Replicator Programming as a result of their new Internet connections. They volunteered their services to add anchovies. And, by a clever feat of engineering, these were a new type of anchovies that didn't taste like anchovies.

Buckeye State had allowed Thumbkin laboratory space as a publicity stunt to make the public forget about Millicent and Gumbon's gaffes. Caesar came to him there one afternoon. Thumbkin knew he had the wealthy man in the palm of his hand (to use a ridiculous metaphor), because Caesar had come alone rather than having his secretary call.

"There's the matter of my Sibeliuswagen X-03," Caesar said. "I can't find a local mechanic who knows what's wrong. They want me to send it back to Finland."

Thumbkin discovered the problem after only an hour of investigation.

Swinging himself out of the engine compartment on the alternator belt, he reported, "There's a family of mice living in the air intake manifold."

"Nonsense!" Caesar scoffed. "None of the other mechanics found mice."

"None of the other mechanics actually walked through the intake manifold. But there's another problem: your fuel supply."

"The fuel line is fine," said Caesar.

"Fuel _supply_. Tell you what. You need a loaner? I'll have to keep it overnight."

Caesar decided to take a cab when he realized the loaner was Thumbkin's hand-held bicycle.

Next day, Caesar returned to find Thumbkin crawling out of a strangely empty engine compartment.

"What have you done to my engine?" shrieked Caesar.

"Improved it. It now runs on hydrogen. I installed nanotubes to process the hydrogen, but you'll find it's fairly cheap, and a tank should last you about -- oh, say 2000 kilometers."

Caesar jumped in the car and revved it up. Thumbkin rode on the dash, car-dancing to the music Caesar had on the sound system, "Dr. Mesmer's Spiritual Ferret" by Machine Embryo. Several miles later, Caesar said, "You did it! Well, let me write you a check."

"Not so fast," said Thumbkin. "You promised a controlling share of the stock in your company. And I have witnesses -- everybody at that graduation."

Caesar harumphed. "Well, of course. I meant we can meet in my office tomorrow about noon and draw up the papers."

"_Not so fast_," Thumbkin continued. "There's the small matter of my future bride."

"You can't mean Princess," groaned Caesar.

"The woman of my dreams. The mother of my future children."

"You realize she's a free woman. I was only joking when I said I'd marry her off to the winner of my contest."

"I was only joking when I said your car will continue to run," said Thumbkin. "When this tank runs down, you'll have to find the gas lid release, which I conveniently relocated."

Caesar sighed. "Well, she could do worse. Of course, I always wanted grandchildren, and you don't seem -- "

"Don't tell me what I can and can't do," said Thumbkin.

* * *

Thumbkin soon learned why Caesar gave in so easily. Princess had been an idealistic, bright girl until she went wrong at age eighteen. Now she was heavily involved with a drug lord named Dick Troll.

Troll was a massive, ugly man who paradoxically exuded sexual magnetism. Standing over seven feet tall, he routinely provoked terror in his criminal lieutenants by barefistedly punching holes in the roofs of their cars, or hanging them by the back of their shirts on basketball hoops. Women, however, swooned over him. Princess, Caesar's sexy daughter, seemed to be one who had been swept up by his animal charm.

Thumbkin decided that he could best win Princess's regard by showing what a goon her lover was. He showed up in Troll's lavish, tastelessly decorated apartment unannounced. In fact, he simply crawled under the door.

"I've heard of you," Troll said. "You're the little chemistry major that Daddy Caesar wants my woman to hop in bed with. Never happen. Princess goes for big men."

The bigger they are, the harder they fall, thought Thumbkin. But he merely said, "I think Princess will go for a big brain rather than a big mouth."

"Haw. Your brain can't be much bigger than my little toe, now can it?"

"Doesn't matter," said Thumbkin. "Your brain is smaller than _my_ little toe."

Troll had not had much opportunity in his short life to learn anger management, so he lifted his huge athletic shoe (size 23 triple D) and stomped down hard on Thumbkin --

-- or rather on the place Thumbkin had been. The nerve impulse between Thumbkin's head and Thumbkin's feet was quite short, him being so small and all, so he was gone like the beam of light from a laser cat toy.

In fact, Troll had slammed his foot down on a fork Thumbkin had surreptitiously dragged in behind him, and the fork flew in the air and embedded itself in the bridge of Troll's nose.

Thumbkin thumbed his own tiny nose at Troll, and the mammoth drug lord dove after him. The tiny man led the giant on a wild goose chase around the posh apartment. A priceless lamp in the shape of Elvis exorcising a demon from Marilyn Monroe crashed into the plush sculpted carpet, burning a hole in the beautiful cabbage rose design. The chandelier, composed of dangling crystal Hummel knockoffs, crashed as Troll made a wild jump for Thumbkin, who was shinnying up the electrical cord. Troll slid through the door to the downstairs powder room and skidded only to slam his head into the porcelain toilet base.

Thumbkin perched on the purple crushed velvet commode cover and swung his legs. "Don't make me do this," he said. "Can't we fight over her like gentlemen?"

"A duel!" Troll roared.

"A drinking duel?" Thumbkin asked. He knew the answer. Troll's forte was in more deadly drugs than alcohol.

* * *

A half hour later, Thumbkin sat on the coffee table, which was surfaced with rose quartz inlaid with shark teeth. Troll sat on an orange flower-print leather sofa. A hundred-dollar bill and a pile of pink powder rested between them. Tension was in the air.

"Pure Strawberry Lucid," said Troll. "The man who's left standing gets the babe."

"If she'll have me," said Thumbkin. He hated how tiny his voice

sounded, and he had some ideas how to fix that if he won the lady and the stock.

"Haw!" barked Troll, and rolled up the bill. He laid a line of the designer drug on the table and gave the bill to Thumbkin.

Thumbkin staggered under the weight of the bill. He clasped both arms around it to keep it from unrolling. Then he laid it to the line and began to inhale.

Assemblers he had sprinkled on his upper lip went to work. They decomposed the organic compound of the drug into harmless gasses. The oxygen gave him a little kick, but other than that, he felt nothing but growing tension. Would his plan work?

Troll grimaced. "I have to hand it to you, shorty." He rolled another bill (which Thumbkin had counted on) and laid another line.

Thumbkin had a different kind of assembler ready and he dropped a pinch of them into the line while Troll closed his eyes waiting for the rush.

The drug and the assembler reached Troll's nose and began their transformation. His nose began to weave itself into a bright pink bungee cord. One end was stuck to his face, the other to the hideous coffee table.

"Mwat nave nou none?" roared Troll. He tried to yank himself away, dragging the coffee table around the room with his bungee-nose. He twisted and rolled this way and that, but his struggle only resulted in wrapping his nose around his neck three times. He clawed at his nose-necktie, bellowing like a boar.

Thumbkin, straining every muscle he had, lifted the phone off the hook and punched numbers.

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"I don't know," said Princess. "I admit, seeing him like this kind of shoots down his sex appeal. But isn't this a pretty cruel fate, even if he is a rotten, no-good drug lord?"

"If you but say the word," said Thumbkin, "I will send other assemblers to repair his damaged nose and face. Maybe even improve them."

"You certainly strike a hard bargain," she said thoughtfully, bouncing Thumbkin on her palm. "I hardly know you. And you're -- well -- uh, not to my scale."

"Oh, if you want me to, I'll set him free no matter what your decision about dating me. Just say the word."

She looked relieved. "Well, that's big of you. Why don't you mail the repair assemblers to his secretary? That way he won't come after you."

"I'm not worried," said Thumbkin. "He tried that before."

She smiled and held her hand out so that Thumbkin could climb up on her shoulder. The two went to a nearby Mocha House and ordered a decaf iced cafe voltaire with cinnamon sprinkles, which turned out to be a favorite for both of them.

"I have to admit, I do admire your style," said Princess.

"And I yours. You had that big gorilla eating out of your hand, didn't you?"

"My father never understood," she said. "I thought I could save Dick Troll. I thought the love of a good woman would turn his harsh soul to goodness. I love a challenge."

Thumbkin dragged the sugar container over to their cafe voltaire to use as a step so he could dip out a portion in the thimble he always carried with him. "I love this stuff! If I ever go crazy, stop me from designing assemblers to turn Lake Erie into a sea of cafe voltaire!"

Princess gave him a serious look. "I'll keep that in mind."

"Listen to me," he said. "You don't have to make a commitment. I know I won that game with your father, and then I duelled with your monster lover. But you do what you want. You're a free woman."

She sat back and settled her cashmere sweater around her shoulders.

"Well, excuse me! It's really so darn flattering that you want me so much."

"I didn't mean that," said Thumbkin. "I want you more than anything in

the world. Lord, Princess, I can have most anything I want. Haven't I proven that today? But what I want is you."

"You'll have to prove you really, really want me," said Princess. Thumbkin's heart fell.

Another test.

"I want," she said, leaning forward so her hair draped like a silken curtain all around his body, "the Moon and Mars."

Thumbkin didn't like the sound of that.

She sat back. "Come on now. You're the master of nanotechnology, but maybe that's because it's been swept under the rug. It's only taught at backwater universities, because the labor unions don't want people to lose their stupid jobs."

He gulped. "True enough. I changed a little bit of the world. I wiped out crime in Great Lakes City. I abolished world hunger. I changed a gangster's nose into a bungee cord. But I can't change people's minds right here in northeast Ohio. They don't like nanotechnology."

"And that's why my father will never be able to set up shop on the Moon. I want the Moon. And Mars. And some other planets. For my father. For us. Space travel. Well?"

He sat down heavily on the edge of the sugar container. "Give me some time to think this over."

* * *

Thumbkin went back to his apartment on top of his friend's microwave. He watched the news on a wristwatch TV his mother had given him. He flipped through his graduate school textbooks. He had had them converted to electronic form because he couldn't manage the huge, heavy pages. He thought back to his early childhood, when he first learned to use a computer. It wasn't easy, but he finally had learned a kind of touch-type tap-dance that accomplished what he needed. He used a touch screen instead of a mouse, and reclined the monitor so he could reach the icons he needed with a drinking straw.

For a week, Thumbkin surfed the web. And he surfed the pages of his own mind.

When the week was over, he went to Princess again.

"If you will be mother to my children, I will send them to the Moon, and probably beyond."

It was her turn to ask for time to think. "How can you promise me such a thing?"

"You either have faith in me, or you don't."

* * *

Princess and Thumbkin had a quiet wedding. Her father, Drs. Pete and Polly Grand, and a few friends from both sides.

I won't describe their wedding night. They were creative people, and since you, my reader, are also creative, I will leave such matters to your imagination.

Thumbkin was busy lobbying and petitioning, and also finding scientists to listen to his plans.

A year later, Thumbkin took Princess to dinner at Monaco's in the Flats. After the espresso and tiramisu, he carefully swept crumbs off the table by dragging a napkin across it. Then he brought a small green egg out of a suede bag he had carried in with him. "In here," he said, "is the future." He put it on the table.

She reached out for it, but he said, "I'll roll it over to you, but be very careful. Inside are our children."

She drew back, then as if by an act of will, took the egg. "You have done this without my permission. You've taken our DNA, mine and yours -- but without telling me -- "

He bent his head sorrowfully. "I did not truly trick you. You promised we could have children. In this egg, a thousand children are growing. Nanomachines feed and rock them. Our images are projected into their minds." He didn't mention that the children were so small their eyes perceived images

in blue and shades of ultraviolet. Princess would figure that out soon enough. Now, the revelation of their existence was enough.

She touched the egg. "A thousand?"

"A thousand and twenty-four. We must name them. We must find ways to communicate with them. We must teach them and provide the best education possible." He reached out and grasped her index finger, hugging it to his breast. "We must love them."

"Astronauts," she said. "But how can they go to the Moon? How can they operate a space vehicle? How can they live in a space habitat?"

"We will teach them to control the assemblers and the manipulators," Thumbkin said.

Princess held the egg in her hand, and suddenly Thumbkin was afraid for it. She could crush it, and he couldn't stop her.

But instead, she asked, "If I put it next to my heart, will the heat of my body harm them?"

He smiled, relieved. "The egg converts heat to energy for the nanomachines that tend them. You could put it in a fire and they would thrive."

She kissed the egg, and put it in the bosom of her low-cut dress.

"Safe, for the time, then. You've been busy."

"Our children are so small, they don't need space agencies. We can build a ship for them ourselves."

"With Daddy's money?"

He shrugged. "Partly. But also from other investors with admiration for an audacious plan."

"When?"

"Not immediately. The children will grow fast, but they won't be ready for several years. In the meantime, we must educate them."

"You promised me the Moon and Mars," she said.

He squeezed her index finger, then climbed onto the cuff of her velvet jacket. "Have I failed your test, then?"

She thought for a minute, but she knew the true answer. "No. No, I guess not. My children will go to the stars. I guess that's enough."

"They will write home," he said.

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