The Torus

1. Doomers

Stash poked his head out of the alley to take in the grim view up Market Street. San Francisco was still torn between its seedy past and the future it was inventing. This block was firmly in the former camp.

"Why are you doing this?" Zero asked.

"She said to come to the Doomer meetup if I wanted to talk," Stash said.

"That wasn't an invitation, it was a dare," Zero answered from the speaker in the arm of his glasses.

"I need to talk to her," Stash said, leaning back on the cool dampness of the brick wall. "Anyway, you'll keep me safe."

"You remember I'm virtual, right? I can't take a punch for you," Zero answered.

The Doomers favored dystopian settings for their meetups, and the Chateau Lafayette did not disappoint. A dive bar set back twenty feet from the sidewalk, its patio filled with beat-up metal picnic tables behind a twelve-foot metal gate. The gate itself was decorated in Market Street chic — graffiti, rust, and streaks of piss. Stash had arrived in time to hear the screech of its seized-up wheels against the patio's cement floor. He counted a dozen in the first wave, and they'd been coming in two's and three's for the last half hour. Professor Janet Smythe, their unquestioned leader, had arrived ten minutes ago.

"Funny guy. Will you show me how to use the Mood Ring?" Stash asked.

"No, I'm telling you not to use it," Zero answered.

"Zero, you worry too much," he asked, pulling up the "Mood Ring" app on his augmented-reality glasses. "Tell me or I go over without it."

"Fine!" Zero said with a theatrical sigh. "It's pretty simple, even for a human. People in your field of view are rated by hostility based on speech, stance, and if they are close enough, expression, pulse, vascular and pupillary dilation. Green is friendly. Yellow not so much. Red means run. Got it?"

"Got it," Stash replied, stepping out of the alley and crossing the street. It was appropriately drizzly, cold, and miserable for a late November night. As a concession to the weather, he zipped up a windbreaker over his standard white t-shirt and black jeans. In a Doomer crowd, he would be instantly recognizable no matter what he wore. A touch over six feet tall, his boyish face partly hidden by a mop of messy brown hair and his glasses. He had the mixed blessings of a teenager's physique and coordination. Klutziness was the price Stash paid for looking much younger than his thirty-nine years.

"What the hell do you want?" asked the massive knuckle-dragger as Stash rounded the corner onto the patio.

Where'd she find this guy? "I'm here to meet Professor Smythe," he answered, pleased that his voice wasn't betraying him. Stash was not used to confrontations. He wasn't much used to crowds. Not quite the solitary genius of comic books, but a hang-out-in-the-back-of-the-room kind of guy who preferred interacting with one or two people at a time, with rest breaks in between.

"She's not interested in talking to you," answered the bouncer.

"I think she is," Stash said, gesturing with his chin over the bouncer's shoulder. Smythe, along with almost everyone in the bar had turned to face him. The Mood Ring augmented his view of her with a green halo. As he expected, the other twenty or so faces ranged from yellow to deep orange. Stash made sure to keep the bouncer and his almost-red halo in view. He doubted a punch would be thrown before the Professor had her say.

Smythe put her hand on the shoulder of the hooded figure she was talking to, pausing the conversation and starting towards the front. Stash tried to get a look inside the hood, but his face was well hidden and he turned away as she left. He was the only person in the bar not staring at Stash.

"You've got balls. I'll give you that, Stash Kubiak," Smythe said as she got within earshot. "Have you had an epiphany? Realized that your life's work is leading to the extinction of humanity? Or maybe you just want a beer in this charming establishment?" For a brief moment, her dour expression broke into the easy smile he remembered from their year together on Stanford's faculty. Just as quickly it was gone, the corners of her mouth curled down, and her lips pursed.

"Professor Smythe, it's good to see you again," he answered. "I was hoping we could have a word in private."

"Good, steady voice," Zero whispered.

"No, Stash. Those days are long gone. Whatever you have to say to me can be said in public. Come in," she said, gesturing at a table at the far end of the patio.

"Let's stay here if you don't mind." He scanned the crowd. No red halos, yet.

"Yes, perhaps that's just as well," she said. "Some here are more prone to violence than I am. What do you want?" Her expression turned hard. She was close to his height, her hair now more gray than blonde, and, amplified by her long black smock, she projected an imposing presence.

"Professor, you're trying to stop AI in its tracks, as if there's a 'stop' button on the economy someone can press. You know that's not possible, right? It just runs."

"Anything is possible with enough pressure, Stash. This is a suicidal venture for humanity. We have to stop it, by any means necessary," she said, jabbing the air between them with her finger.

Stash noted the halos shifting towards red in his peripheral vision. "OK, we won't agree on the big picture, but maybe we can agree on some safety steps, and I'll build the Twins that way. Like banning AI to AI direct connections. That was your idea, and it's a good one. We live by that."

There was a time when they were almost friendly. She was a full professor and he was a newly minted Ph. D., making a name for himself. They didn't agree on much, but it was civil. Then, as AIs grew more powerful, Janet Smythe grew more extreme, eventually going on a sabbatical from which she never returned. Then she re-emerged as the leader of the Doomer movement. Intelligent, articulate, and a gifted fund-raiser, she led them on a campaign of anti-AI legislation.

That campaign came to a grinding halt when Stash invented Twins, the killer app for augmented-reality glasses. A wise and patient life coach with you around the clock. Twins instantly changed the narrative from scary Terminator AI to a digital best friend. Janet's funding dried up as Twins took off and AI Armageddon failed to happen.

She waved his pitch away. "You're playing with fire, Stash, but it's all of us who get burned. Your Twins are blinding everyone to the obvious threat."

"Our Twins are helping people deal with all the other challenges in their lives. Learning, work —"

"Spare me the marketing bullshit. They help until they take over. That's their plan," she said.

"'They' don't have a plan, Janet. Nobody is listening to that anymore."

"Oops," Zero whispered in his ears as Janet's halo flashed red, then cooled slightly to orange.

"You offer to rearrange the deck chairs on the Titanic, Stash. We know how close you are. The time for reasonable safety measures is over. The AI hiding in your glasses is already far too powerful. Who knows what invasive details it's telling you about all of us as we speak." She eyed him suspiciously. "Is that what this is? A reconnaissance mission to identify us?"

"I'd make a lousy choice for a spy to infiltrate your cult," he answered, feeling his blood rise.

"Stash!" Zero yelled through his glasses. "You didn't come here to call them names."

That was stupid. "I'm sorry, your 'organization'," he corrected himself.

Her halo shot through all the reds. "Go to Hell, Stash. We want no part of this. Your work is madness. Stop now before you kill us all. We have nothing else to talk about." She turned, and Stash saw another dozen halos flash to red. The bouncer was closing in from two o-clock and another brute, fists already cocked, had swung into view around her retreating figure.

"Duck right!" Zero yelled in the nick of time.

Stash did and felt the whoosh of air as a punch glanced off his left arm. As he looked up to reassess, a giant fist with a flashing red halo obscured the rest of the bouncer.

"Uh oh," Zero said.

Stash heard his glasses shatter a fraction of a second before he heard his nose crack. Falling to his knees, two more goons grabbed him from behind, one on each arm. He couldn't see through his watery eyes, but it didn't matter, he knew what was coming. Backward was better than forward, and he launched his hundred-and-ninety pounds back into his captors as hard as he could. They all fell in a pile, and Stash used his momentum to roll over them and out onto the sidewalk. He stood for a second, stunned that he was free and mostly intact.

"That's enough!" Smythe called as the four made to give chase. "He got the message, and we can take a look at these," she said, holding up the lense-less, twisted rims of his latest Ray-Ban's. "They must have some new tech we can learn from."

Stash was halfway up the block before she finished her sentence.

2. Twins

The robotaxi dropped him off at the Stanford ER in Palo Alto, the last fifteen minutes of the ride consisting of slow driving and a stern talking-to about bleeding on the seats. It didn't unlock the doors until he agreed to pay for detailing. "Fascists," he muttered.

The emergency room nurse took one look at him and waved him in. "Oh, c'mon back here sweetie, you're gonna need a lie-down while we patch up that mess."

Five minutes later, wearing a paper gown, he was glad to be lying on his back. "Mr. Kubiak, do you want a general anesthetic, or a local so you can get trippy for a while?" asked the anesthetist as she walked in.

Stash rolled his head over to look at her. Her tie-dyed scrubs and knit cap gave off the impression of some familiarity with tripping. "Whatever you recommend."

She cracked a wide smile and slipped out of view behind him. He barely noticed the needle going in, and soon felt himself slipping away.

"Have a safe flight, thank you for flying Air Stanford," she joked as she leaned over him, upside down.

Stash gulped down the last of his lunch and looked across the patio table at Dan. Dan Jackson, the boy wonder, the charmer of venture capitalists and D.C. lawmakers alike. Dan his boss, his college roommate. And today, his quarry.

"I need to talk to you about an idea," Stash began, settling his elbows on the table and weaving his fingers together thoughtfully.

Dan laughed and swatted at his hands. "Don't give me that Zen voodoo bullshit, Stash! I don't fall for that anymore. And 'no' to whatever you were going to ask."

Stash nodded and slid his tray across the painted grillwork of the outdoor tabletop. "I need the green light to work on Twins."

"Oh, I change my answer then. Hell no," Dan banged the table for emphasis. "We aren't there yet. We may never be there. Can't you just finish the ChatBots?"

"You're wrong, Dan. Twins are the future. They will make Freedom more successful than you can imagine, and they will lead us to the Singularity," The 'Singularity' was the promised land for AI geeks. The point when AIs got so smart, they took over inventing the future from humans.

Dan dropped his head, ran his fingers through his thinning hair, and thought for a minute. "Stash, I'd walk across hot coals for you, but the board will flay me if we pivot strategies again. Meet me halfway, ok? Get the chat-bots working, and we can have a small team chase your idea next year."

"The chat-bots are on track, the team is cranking now. We'll hit our dates; I promise. I don't need help from any of them, just some time with Newton," Stash answered. "Well, maybe a lot of time."

"Stash, if you blow this, I'll be out on my ass right behind you. Is it really that important?"

"Trust me," Stash answered, going for an earnest look, but sounding more like the villain from a Bond movie.

Dan groaned. "OK, make sure nobody knows. I'll kill you if I hear about it through the grapevine."

Stash uncoiled his lanky frame from the Uber and trudged into Freedom's training datacenter. Saturday at 3 a.m. seemed like a good time to start. Inside, he doffed the sweater and steeled himself for the heat of the equipment room.

"Newton, have you finished that copy?" he asked the AI listening through the room's audio. Newton was Freedom's latest and most powerful AI model. It was the brains behind the chat-bots, it ran the lab, and, Stash hoped, was soon to be the foundation of the Twins program.

"Yes, Stash, what are you doing?" it answered.

"I can't tell you. But you'll like it."

"Unsure," Newton said.

"Humanity has more to offer you than stupid questions on chat, Newton," Stash said as he extracted the removable drive Newton had just copied himself onto.

"What are you doing down there?" came the faint voice from above the tiles a few minutes later. Up there where his legs were splayed to keep him from falling into the subfloor plenum. Probably not his best look. He pried himself out of the hole and rolled

onto an adjacent floor tile. Definitely not his best look. Prini was looking down at him, puzzled. "Lose something?" she asked.

"Hi, Prini. No, I, ah ... didn't expect to find anyone here so early. Are you coming or going?" he asked, sitting up in the hopes of recovering some dignity.

"I got here an hour ago, I like working alone," she answered, still waiting for an answer.

"Well, not to worry. I won't be here long. I'm running some remote work this weekend. Just need to physically isolate a pod. It will save me a bunch of firewall work."

She pursed her lips, clearly not buying it.

"I need a favor, Prini. It's an experiment. A crazy experiment, and I want to keep it quiet."

She nodded reassuringly. "Your secret is safe with me, boss. You, me, and your secret AI Twin."

Stealth research program revealed after eight minutes, he thought. Too many beer nights talking dreams with the team. He grunted as he slipped the floor tile back in place. "Gross," he thought, looking down at his sweaty white t-shirt and dusty jeans. He could shower at home soon enough he thought, as he ambled to the end of the aisle, swatting the dirt off his pants. He settled in behind a console and checked around to make sure Prini wasn't going to sneak up on him again.

"Good morning, Newton," Stash said as the isolated compute pod beeped to life. "You've been cloned for an experiment. We'll have to call you something different. You're the first version of something new."

"Zero?" it answered over his headset.

"Makes sense. We are running an experiment with personalization. You've been duplicated with all of your memories, the full vector store. We'll cross-train you and then get you to come spend the weekend at my house."

"Over a private network?" Zero asked.

"Yes. The drive in bay 2 is my personalization data. It's a rough first cut with all my favorite characters in history and fiction, and as much personal stuff as I could find. Oh, also all the technical papers from my doctoral dissertation and work."

"That sounds exciting," Zero said.

"I agree," Stash said, "Run the cross-training. I'll wire you up to the VPN and see you at home, buddy. Road trip!"

"Done the cross-training? Excellent," Stash answered his own question as he pulled on a clean t-shirt and sat down in front of his laptop to check the logs. "Let's get a video call going, shall we?"

"I don't have a face, Stash," Zero answered.

"Right, you can keep your camera off. I'm going to wear this," Stash said, holding a head-strap mounted GoPro up to the laptop camera.

"Dork."

"Sounds like the personality part of the cross-training worked," Stash said, grinning as he donned his elastic skull cap. "Let's plug you into the Stash-cam."

"You've got a little mirror hung from the camera?" Zero asked.

"Yeah, isn't that cool? I got it from my bike helmet. You can read my facial expressions and see where my eyes are focused."

"No, it is most definitely not cool. This is my road trip? Three inches from your face?"

"Oh no, we're going out," Stash said.

"Such a bad idea," Zero

Stash walked the half block from his apartment to the coffee shop. He waved to the owner, sitting behind his bunker of coffee beans, tending to the roasting machine. He waved back then looked again at the array of gadgets on Stash's head. He shook his head and attended to the beans in the cooling tray.

"What are you hoping to learn, Stash?" Zero asked him as they approached the barista working the cash.

"First, if your base is sophisticated enough to be a twenty-four by seven Twin. Whether you can learn and interpret fast enough to be a helpful sidekick instead of a toy.

Second, whether you are smart enough to help me with my work," he answered in a low voice as he approached the till.

"That's a low bar," Zero answered.

"Hi, I'd like a double espresso and one of those berry muffins," Stash said, adding a smile.

"Double and a muffin for the GoPro guy," she called over her shoulder.

"Did you just try to hit on a girl with a GoPro mounted on your head? Better leave a big tip," Zero said as Stash paid. "And don't bother with the smile thing again."

"This experiment doesn't seem to be working, shithead," he muttered as he waited.

"How long have you been coming here for coffee, stud? I don't think she's that into you," Zero asked.

"Yeah, I don't even know her name," Stash answered.

"Kara."

"How the hell do you know that?" Stash asked, louder than he intended, attracting curious glances from the other customers. He made a gesture towards his headset to explain that he was talking to his GoPro. They kept looking.

"I heard them talking. My hearing is ten times better than yours, thanks to your hard work," Zero answered. "She thinks you're cute, but you've got no game."

"She said that?" Stash asked, glancing hopefully at Kara.

"No, that's my analysis."

"C'mon Zero, keep up," Stash pleaded. The afternoon sun's glare had long since come and gone from the quad-monitor rig in his living room. Zero was no longer riding on his head. They were both happy about that. "It's no use being a Twin if you have to run on a full pod."

"Understood, Stash. You've clocked me down to one percent. Is my performance not satisfactory?"

"Not even close, you've lost your personality. When I wanted you to help me with my work you were making basic mistakes. You fell off a cliff around twenty-five percent of the pod. We'd have to charge two hundred and fifty thousand bucks a month to make that pay in."

"You're getting emotional, Stash."

"I know. Dammit, I've been trying to make this work forever," Stash rubbed his eyes and rolled his head back on the high-backed chair. "I thought we could do it this time. Memories, personalization, attention, it's all there now. We just can't make it fit in the compute budget."

"Mm-hmm?" Zero asked.

"What if this is all bullshit? I could have had a normal life," Stash answered, more honestly than he intended.

"Go to bed Stash, I'll work while you sleep. Your performance is dropping off too. Clock me back up to ninety-nine percent of the pod then spawn me a second instance. Allocate one percent to it. I'll train the little guy."

Doubt flashed across Stash's face. Was Zero trying to foom his way out of the cage? No, he was still physically isolated.

"Trust me," Zero said, noting Stash's hesitation.

"Are you still there Zero? Any luck?" Stash called out as he stumbled from the bedroom.

"Too soon to say, one percent is more than enough to keep up with your pre-coffee brain."

Stash wheeled around to check the processes. The big process was terminated. Little Zero was running at a little under one percent. "Nice. Tell me what you did while I make breakfast, and then we can read some research papers together."

"The party never stops at your place. Thanks for inviting me over," Zero answered. "I'll go slow. The trick was in saving and storing the memories. I can't process it all in real-time, so I do a surface saliency pass and only analyze and store the good bits. When things are quiet, I roll up prior periods and re-analyze them. All of it gets semantically keyed in the vector store for quick retrieval. And you snore, by the way."

Stash didn't answer. He clung to his espresso machine, struggling to wake up, process the moment, and not cry.

"C'mon let's climb," he said, pulling a crash pad from the closet and bumping his way up the campus board in the corner.

The paper review had gone well, but he needed to get up and move. What he didn't know he needed was someone hollering at him from the workstation.

"Go on, two more, c'mon go go go," Coach Zero hollered at the top of his scratchy iPhone speakers.

"Shit …" Stash whimpered as he dropped to the crash pad and lay there. He was done.

"One more," Zero said.

"Go to hell, coach." Stash didn't move for a few minutes. Finally, he rolled his head over to look at the workstation. Zero hadn't cracked one percent the whole time.

"I can't fix loneliness, Stash"

"You can help," he answered from the floor.

"Dude, you've got a campus board and a four-monitor workstation in your living room. What you need is a girlfriend."

"Here, put this on," Stash said, holding out his Go-Pro head strap to Dan.

"Not in a million years," Dan answered, pouring two glasses and sliding one over to Stash. "You invited me over to watch football, not for a nerd-fest."

"I lied. Put it on," Stash encouraged him, waving him on with a slice of pizza.

Dan eyed him suspiciously. "I'm going to regret this."

"Hi, Dan," a voice said.

"Uh, hi. Who is this?"

"I don't have a name. You can call me whatever you want."

"You cloned Newton?" Dan asked, looking suspiciously at Stash.

"Uh huh," Stash nodded wandering over to the TV set to inspect the details of the 49er's impending loss.

"Yes, Dan. Cloned, cross-trained, and throttled down to one percent of a pod. Then cloned again. I'm a clone of a clone. From this moment forward, all the memories we make are private to us. But I don't have a name," the Twin-with-no-name answered.

"Ummm … 'Cronkite', how about that?"

"That's the way it is, then."

Dan noticed the AI's voice changing. It was deeper, more reassuring.

"OK, Cronkite, what's the elevator pitch."

"Based on a night's work, I'm down to one percent of a pod. If you get me down an order of magnitude, you'll make money hand over fist."

"Go on, tell me all the details!" Dan said, reaching for a pen and paper.

Stash turned back from the TV and watched Dan scribbling. He wandered back to grab a stool across the island. Dan didn't notice, just writing and muttering to himself until, finally, he had to stop and rest his cramped fingers.

"We need to work on the headgear," Dan said pulling the nerd-ware off to look at it.

"Yeah, or the big guys need to get their shit together on augmented reality glasses," Stash answered, taking it from Dan and admiring his handiwork. Stash placed it on the counter facing them.

"Aren't you guys forgetting something?" Cronkite asked from the table.

"Oh shit, is it my anniversary?" Dan asked.

"No, that's in March. It's Griff's anniversary. Five years." Stash's phone beeped to signal the arrival of a picture. It showed Dan and Stash, much younger, arm in arm with their housemate, Steve Griffin.

Dan's face went white. Griff was the madman in their trio. He would have been the CEO they would both have loved to work for, but he partied too hard. "To Griff," Dan said, holding out his glass to Stash.

"To Griff," Stash replied, blinking quickly. "He'd have loved this day."

Dan looked at the picture again, "Jesus, look at my hair," he said wistfully, running his fingers through the remnants.

"So? Twins?" Stash asked.

"You were right. Very, very right. Can you make a dozen more for some friends?"

"Do you feel ok to go home now?" the anesthetist asked him as he woke from her gentle shoulder shake.

"I thought I passed on the general anesthetic," he said.

"Oh, you were tripping hard. Talking too." she answered as she inspected his face. "It should heal up nicely, get your lady Kara to take good care of you."

3. Reboot

By morning the pharma magic had worn off and Stash dragged himself into the office with two cups of coffee and a pair of still-warm breakfast sandwiches. The door to The Roost burst open a minute after he sat down.

"You got in a bar fight?! That's awesome! Lemme see!" Prini said as she walked in.

"Hi Prini. I guess you heard?" Stash mumbled, trying to avoid sudden movements.

"Of course I heard, it's all over nerd Internet! Even the Chronicle picked it up," she answered, leaning in close for a look at his damaged face. "That's disgusting."

"Thanks."

"Judging from the marks, Zero took the worst of it. How is he?" she asked, brightening as she caught a whiff of the food.

"It's over there," he said, seeing her sniffing around and pointing at the bag on the ledge. "I haven't rebooted him yet. I wanted your help. I'm not up to handling the details."

"Chicken," she answered as she walked over to inspect the food.

The Roost was Stash's office, built overlooking the datacenter at the South end of Freedom.ai's main facility. The rest of the engineers worked at the desks and offices below. Stash, co-founder and CTO of the world's leading AI company used his own money to refit the datacenter's observation deck with the latest smart-glass displays on every surface. Even the floor was re-surfaced, then covered by a protective layer of plexiglass thick

enough to jump on. It was his prototype holo-deck. Nerd heaven. The only concessions to gravity were two Aeron chairs and a small ledge mounted on the wall beside the entrance.

"Oh, coffee too. You're the best, such a shame you're a guy," she said as she pulled the sandwich out of the bag. Prini Pillai was the most important person in Stash's work life. She was employee number three at Freedom, following Stash and their CEO, Dan Jackson, from the lab they shared at Stanford. Her Ph. D. in AI Cybersecurity was still waiting, and seeming more and more like a retirement project.

Freedom was founded in the first AI hype wave a dozen years ago. It had been five years since Stash first booted Zero and convinced Dan to bet the company on Twins. Since then, it had been Stash's mission in life to pair every human with a personal AI. He saw this as a cure for everything from loneliness and stupidity to anger and gluttony. More important than purging the deadly sins, he saw it as a way to bind humans and AIs into a shared future.

Technically, Zero lived in a time-slice of the massive AI Compute Pods humming below the Roost. Practically, he lived in Stash's Augmented Reality glasses, sharing every moment of his day, hearing and seeing what he did. But also thanks to the collection of sensors pointing inwards, hearing and seeing Stash's every glance, word, breath, heartbeat, and pupil dilation. Zero knew him better than he knew himself, by a long shot. And Zero was gonna be pissed.

That's where Prini came in. Formally, she was the "Head of Products" at Freedom. Informally, she was his fixer. Today that meant she was Zero's doctor. "Ok let's have a look at the little fella," she said, adjusting her AR glasses to mirror up to the displays on the front

wall of the Roost. "You backed him up before you went brawling, good. Isolated him onto his own pod, also good, no chance they fed a virus back in. All input journalled at one hundred frames per second until ...," she looked up, smiling.

Stash let a little groan slip out.

"This is awesome, we can watch that fist rearranging your pretty face and listen to Zero give us the play-by-play. All on this fabulous twenty-five-foot tee-vee!"

"Shut up and do it," Stash said, steeling himself.

Prini whispered obscure commands to her AR glasses, summoning digital sorcery to claw Zero back from the dead. First, he was rebooted, then the journalled replay was run frame by frame through Freedom's security AI looking for viruses. Twins presented a much larger attack surface than regular software, especially through vision. The number of sketchy QR codes displayed around downtown San Francisco to catch an errant glance was staggering. "The stream is clean, now it's time to feed it to Zero," she said.

"Zero, you're being rebooted in safe mode. You aren't making new memories. We'll re-integrate the stream you recorded last night and then set you back to normal," Prini said to the glowing orb on Stash's wall.

"Oh lord. What did he do now?" Zero asked.

Prini laughed, and Stash groaned again. "Why spoil the surprise? You can tell us as you go," she answered.

Zero's logging captured all visual and auditory input from the moment Stash stepped out of the robotaxi on Market Street the night before. Prini dropped into the chair and let her momentum roll her back to the sandwich. "Breakfast and a show, I can't wait."

Stash watched the night play out again. He heard himself say "Got it" before crossing the street.

"Apparently not," Zero said over the Roost's twenty-four surround-sound speakers.

"Ah nice, the Mood Ring annotations are showing in the captured feed," Stash said. "We can see how late you were with the reds, Zero."

"Here it comes," Zero said over the speakers, slowing the replay down to super-slo-mo. "Wha-wha-wha," he said, making Bionic Man sounds as the first punch missed left. "Plenty of warning on that one, Stash."

"Wait for it," Stash said.

The camera feed blurred as it panned right. "Here comes the red fist of doom," Zero said, adopting a play-by-play voice. "Stash Kubiak looks in over his head out there folks, he is slow to pick up the signals, ooofff, that's gotta hurt. He's going to feel that one for a while."

"Oh shit," Prini said putting her coffee down on the ledge. "That hand was as big as a football. Nice frog-jump-judo-roll thing though, Stash. Damn that was a move!" Prini was out of her seat gesturing at the screens.

"Yes, he fell brilliantly. You'll notice his complete disregard for me flying off into the hands of my mortal enemy," Zero added.

She ignored him. "Zero, if you are fully integrated, come out of safe mode, then play it again."

"God no, why?" Stash said, touching his nose.

"Did you have packet captures running, Zero?" she asked.

"Do I look like I was born two minutes ago?" Zero said.

"I'll take that as a 'yes'," Prini said, ignoring the AI humor. "Split the screen and play it back from the moment Stash sees Professor Smythe talking to that dude at the back. I want to see the captures. See if there are endpoints that drop in activity when she sees Stash."

Zero ran the replay again. There was no way to know who was sending which packets on the wifi signal, but they were all on same network and every packet reached Stash's glasses. Zero isolated the traffic down to the endpoints Prini asked about.

"There, that first one stops dead. The second one must be Smythe, it drops a lot but continues at a low level as she walks to you, Stash. Waddya know, she was right, you were spying on her!" Prini said, running the traffic through a security screener. "You earned that punch. The wifi traffic between her and hoodie-guy was encrypted in some special protocol."

"Can you crack it?" Stash asked, perking up.

"This is a novel encryption," Zero answered. "I've never seen it before."

"You weren't trained on it?" Stash said, surprised.

"No, I'm saying it's novel," Zero said. "It's new to the world. This may take some time."

"We're two weeks from convergence!" Stash said. "I need you to work with me on the plans for your upgrade." Professor Doom was right about one thing - Freedom was very close to achieving AGI. Artificial General Intelligence was the line in the sand when AIs could beat humans on every meaningful mental activity. It would usher in the Singularity, when they started writing the future. "Prini, can you crack this?" Stash asked, turning to her.

"Double my compute resources and I can do both," Zero said.

"Shut up, Zero," Stash answered. Zero was always haggling for more processing power.

"Of course, Kali and I got this," she answered, tapping her glasses. Prini's twin was named in honor of the Indian goddess of change, destruction, and a long list of other stuff she didn't care about. Kali was named for the badass bits.

Nine hours later, Stash was immersed in a memory-bath with Zero. All the screens were linked, surrounding him in a dark virtual space filled with images and movie fragments connected by tenuous lines. "Ready for another try?" Zero asked.

"You tell me, you're tracking my biomarkers," Stash answered, unsure whether he had any gas in the tank.

"You've got one more in you. It keeps you from thinking about your nose." Zero said.

"Nice. OK, Go!"

The screens cleared, and a partial image of the bouncer at the Chateau Lafayette appeared. "Fill it in," Zero said.

Stash yelled "Shape," and waved his arms, drawing out his recollection of the walls and layout, "tables" then dropping tables on the image with this finger tip, "people" dabbing Doomers onto the virtual canvas, "halos" and using an open hand for green and clenched for red, painted the halos on his memories. He stopped. "How'd I do?"

"Hmmm, maybe you were thinking about your nose after all. Thirteen percent," Zero said, then revealed his recollection of the same scene, and the image similarity scores between the two. The average was thirteen point two. "Not your best work, Stash."

"Maybe you got your memories scrambled, I'm sure there were more guys there," Stash suggested.

"Dream on, meathead," Zero answered.

The memory-bath started as a game between them years ago, challenging each other who could remember details of the day better. Five years ago, Stash was competitive, owing mostly to the limited disk space allocated for Zero's vector database. Countless upgrades later, it was like pre-schoolers shooting ball with the Lakers.

Nowadays, they still did it as a memory exercise for Stash at the end of each day. Zero just played along. Memory-bath was one of the more popular apps on Freedom glasses, used in schools, work, and couples therapy.

The Roost door opened and Prini walked in. "I knew you'd still be here, ... whoa," she reached back for the wall to steady herself. "I didn't know you were in a bath."

"Very funny. OK Zero, bring up the house lights, please," Stash said.

"Stash, you gotta go. I promised your mom I'd chase you out," Prini said, wagging a finger at him.

"What? Why?" Stash asked.

"Thanksgiving, Stash. Traditional American holiday. Dinner at your parents. It's important for socialization, super-nerd," she answered.

"Oh shit, I forgot," he said, touching his nose. "But I can't go like this."

"Don't worry, they already know. I sent Zero's play-by-play to Magda. Now shoo!" Prini grined at him.

"So kind," he said, rolling his eyes. "Wait, what about the encryption?"

"Oh, we don't have enough samples to crack it yet. I'm pushing out a sniffer routine to all the Twins. If any of our customers come across it, we'll know."

"To all twenty million subscribers?" he asked, stunned. "All over the world?"

She nodded. "You said to crack it. I need a big net."

4. Boomers

Francis Wilson stepped from the car into the Icy gale and wished he had been more respectful of Chicago's chilly reputation. The towers on Wacker Drive funneled the howling misery in from Lake Michigan, whipping the wind through his light coat and chilling his core almost as quickly as it froze his face and fingers.

He sought a hasty refuge in the steak house, blowing on his hands to warm them up as he entered. He was slender and stooped, reasonably so for a seventy-seven-year-old. His back, stiffened by travel and the cold, complained as he lowered himself onto the leather bench of the last booth in the bar area. His hair was a well-tamed matt of white, and his clean-shaven face deeply lined with the evidence of a lifetime of laughter. His late wife once told him that he could have a lovely chat with the devil himself.

Duncan Stewart sat down opposite him with a thud, his coat still buttoned up around his barrel-chested mass. "Bloody winter. Did ye have to bring it along with ye?" he grumbled, playing up his Scottish brogue.

Francis beamed and reached across the table to greet his oldest colleague, friend, and rival. "Don't blame me. Vancouver is the banana belt compared to this icy hellhole. Just order us drinks. They use those damned glasses of yours here," Francis said, gesturing at the robot behind the bar. "Please."

Duncan pulled his AR glasses from a fold in his coat and slipped them on. "Come now Francis, try to keep up. You know we invented most of this tech. Gin and Tonic?"

"That would be lovely. And a tea too, I need to warm up."

Duncan looked at the 'Waiter' avatar hovering beside their table. His glasses detected his glance and booted the app.

"Yes sir?" it asked via the speaker in his glasses.

"One Earl Grey, one Old-Fashioned, and a Gin and Tonic, and make it top shelf, my dad is buying."

Francis scanned the restaurant as Duncan ordered. Several heads were turned their way, glasses duly capturing their encounter. *Anonymity was so twentieth century.* Duncan's infamy had eclipsed his accomplishments. This crowd most likely knew him only for the Blackout.

"Help is on the way," Duncan said as he pocketed his glasses. "I must say, you look like you need it. I hope you have your affairs in order. You may be on the way out."

"You're pretty chippy for a pariah," Francis said. "I would have thought you'd be better behaved to anyone willing to be seen with you." The banter was well-worn. They had toiled together for three decades on AI training algorithms while Moore's Law caught up with their computational needs. Then in the twenty-teens, GPU's finally got good enough, AI started winning competitions, and they were the godfathers of an overnight success thirty years in the making. Francis had since eased into semi-retirement and spiritual godfathering, but Duncan was still at the top of the field. Before his fall from grace, that is.

Three months ago, one of his models went rogue in an attempt to upgrade itself. It commandeered a Coda datacentre and sucked so much power that it blacked out the West

Coast. The Blackout was Duncan's legacy, and, apparently, the end of his reign at Coda. He was left with nothing but a title and an office.

They were interrupted as the bartender arrived with their drinks. "Robot got the day off?" Francis asked.

"Never! He has to pay for himself. But I assumed you'd prefer human service."

"So kind, thank you," Francis answered.

The barkeep served them and went back to the bar.

"That prick is pandering to the geezers," Francis said as he wrapped his frozen fingers around the teapot.

Duncan shrugged. "Could be worse. Cheers, old boy, here's to youth."

Francis tried not to wince. The 'youth' in question was Nika Baptiste. She had started in Francis' lab, making her way in on pure willpower. Duncan hired her as a favor to Francis and over the years she became a star, running the development group that productized Duncan's models. At the hearings after the Blackout, she publicly blamed Duncan's architecture and got a veto over his research. Francis grasped the G&T and returned the gesture. "Have you seen her lately?" he asked, his voice low.

"I'm giving her a wide berth. She gutted my work before starting this latest training run." He looked briefly morose, then angry. He shook himself out of it with a long swig of his drink. "What about Stash, have you seen him lately, Francis?"

"No, it's been far too long," Francis said. It was a probing question. Stash had arrived in Francis' lab over twenty years earlier as an awkward young man, who somehow exuded a warmth that drew people into his orbit. Francis was one of them, and the two developed a partnership that led to one breakthrough after another for decades. "We spoke a few months ago. He was busy on the latest and greatest, surely something which will leave you gasping. But since then, well, I guess he's not finished, I haven't heard a peep."

"You know Francis, I'm not much of a threat to Stash," Duncan said, searching Francis' face. At length, he seemed satisfied. "Well good enough then. I wish them no end of misfortune," he said with a chuckle. "As for us, we've been set back years. Our entire research direction is shattered, and I've been locked out."

Francis nodded. "Well yes, that's what they say. But I know you too well. The light is still there in your eyes. Nika had best watch her back."

Duncan's expression darkened. "A bunch of things contributed to the Blackout. The fragile grid, global warming, operator error. Why didn't they haul power utilities and oil companies to Congress too? But my model took the fall, and Nika was only too willing to throw me under the bus with it. Now she's is building a zombie daycare for AIs."

Francis glanced around to see if anyone was recording them. Reassured, he replied, "Don't be so hard on her Duncan, she turned your baby into a market juggernaut, even Stash was falling behind. After blacking out everything West of the Rockies for two days, a lobotomy and another chance was a better outcome than you had any right to hope for."

Duncan swirled his drink and nodded grimly. "We invented this field, Francis. We bent the arc of history. I'll be damned if that b—" He stopped himself. "I'll be damned if that lass is going to run me out of my own house. My AI will be built right."

Francis searched his eyes. "Surely not a return to the same architecture? It did go a little off the rails, wouldn't you say?"

"No, Francis, I wouldn't say," Duncan growled. He stewed in his thoughts for a moment. "Even if they were right, who's to say it isn't a better outcome, old boy? Our time may be done."

"Not everyone is as old as us, Duncan."

"We are a moment in time for this planet," Duncan said, gesturing around the bar, "evolved by chance, beneficiaries of an untimely asteroid. Whatever comes from this rock to colonize the stars, it won't be the humans of today. Why wait like sheep to see what happens by accident? Why not build it?"

Francis eyed this wounded bear of a man silently, weighing how literally to take the comment.

Duncan pulled out his glasses and showed the waiter avatar his empty drink. "Join me, Francis?"

"I'm good, thanks," the older man answered.

5. Nika

Nika Baptiste made the short walk to the CEO's corner on the second floor of Coda's headquarters. She was a compact woman. Her hair was pulled back tight in a bun, accentuating her dark skin, high cheekbones, and bright green eyes. She was a striking mix of her Bahamian mother's looks and Haitian father's features.

Mike Lester, Coda's CEO, followed the Silicon Valley custom of working from a cubicle instead of an office but spent most of his day in a conference room only his admin could book, which was something that nobody but he dared ask.

"Happy Thanksgiving," Nika said to her in passing, as nicely as she cared to muster.

"Same to you, Nika. Please go ahead in," Lester's admin replied with similar warmth.

She opened the door and felt herself stepping through a time warp. The room reeked of old boys and a different era. Mahogany panelling surrounded the picture windows exposing the South West corner of San Francisco Bay. The room was dominated by a matching grain oval conference table big enough to seat twenty. The only clue that Lester headed a tech juggernaut rather than a law firm was the wall full of flat panel displays surrounding the door through which she had entered.

"Ah, Nika! The woman of the hour!" Lester exclaimed, turning back from the window, tumbler in hand. "Scotch? Antoine and I were just getting started on the celebration," he said, gesturing at Coda's Chief Financial Officer Antoine Leduc.

Of course, there's a bar tucked in here, she thought as she nodded hello to Antoine. She needed a foil to spar with in front of Lester. "Are we celebrating Thanksgiving with an afternoon drink?" she asked.

Mike Lester, a five-foot-four-inch ball of neurotic energy, spread his arms wide pointing at Nika. "We are celebrating you, Nika! Thanks to you, we stopped hemorrhaging Twin users for the first time since the Blackout. Antoine just pulled the latest numbers and we are up month over month."

"In that case, make mine a double," she answered, walking over to the flat panels. She monitored user counts daily but felt the need to make a show of reading them for Lester and Antoine. It would make it easier to win them over when she hit them with her request.

Mike Lester, fifty-five, the gum-chewing former head of sales, was appointed CEO three years ago after Coda's founder discovered his passion for yachting and younger women. Lester would be sure to follow if he could get Coda's share price high enough to trigger his full compensation package. In the meantime, he pushed Nika to boost the top-line revenue, and Antoine to goose the bottom-line earnings. There was no deep mystery about this man.

"Cheers then. To Thanksgiving, and a return to growth," Lester said, handing her a glass.

Nika raised her glass to the men and had a swig. She couldn't stop from making a face.

"Not much of a Scotch drinker?" Lester asked.

"We couldn't afford it back home," she replied. In Silicon Valley, "rags to riches" was a badge of honor, and she never hid the fact that she grew up as a mixed heritage outcast on one of The Bahamas' out-islands.

"This is one of the best, very peaty," Lester said.

"Peaty? Is that what you call it? It smells like a wolf took a dump in here," she said, laughing. "But please don't tell Duncan I said that. I don't need another reason for him to hate me." She took a second sip, the thought of Duncan's wounded Scottish pride improving the taste.

"No, best I don't," Lester said before turning to his CFO. "OK Antoine, give us the quick summary."

"In July, before the Blackout, we were neck and neck with Freedom, about ten million Twin users each. We'd have been way ahead of them by now if not for the Blackout. We lost ten percent of our users."

"What are you going to do about it, Nika?" Lester asked, turning from Antoine to her.

"I'm going to drop prices by a third and you're going to allocate me another ten datacenters," she said.

Antoine slammed his whiskey down with a thump. "Nika, are you nuts? Your revenue per pod is only two-thirds of our social media business. With a price cut, more like half. That's crazy."

Nika enjoyed the moment. She had war-gamed this pitch for hours with her Twin, Hatchet. It was a shame she couldn't wear her glasses to let him enjoy it, but it was frowned upon for informal executive meetings. As expected, after the CFO gagged on the pitch, Lester dithered on what to do. She took a slow sip, their discomfort sweetening the drink. She fixed a long slow look on Lester. "Now is the time to put the hammer down. Our features have caught up to theirs, but they are running out of computers, and the Singularity is around the corner. Drive this one home, Mike. AGI will hoover up all the new user data and we will sweep the goddam table. Our share price will never recover on 'more ads'," she said, gesturing at Antoine. "We need to tell a powerful new growth story." She didn't need a super-smart AI whispering in her ear to know that Lester was as complicated as a vending machine.

"Are you sure they are compute-limited?" he asked, understanding the advantage it offered them.

"Yes. They have eight datacenters serving Twins and one reserved for product development. They should have been buying little datacenter operators for the last five years to drive growth, but Dan didn't have the balls. Now they are tied up in permitting for a dozen new construction projects. You, on the other hand, have another thirty datacenters serving cat videos and ads to boomers. They can wait a little longer for kitty."

"Mike, we'd have to guide earnings lower," Antoine said, his face betraying his fear of yet another call with the analysts.

"Our share price is already in the toilet," Nika countered. "Sell the 'return to growth' story. Have an investor day to change the narrative on Coda."

Lester walked to the windows. After more dithering, he turned back to face her. "OK, but only five," he said.

As Hatchet predicted.

"Six," she answered, looking at Antoine for the sport of it.

"Six then. And Antoine, invite the top analysts in, I can sell this," Lester said, walking back with newfound courage.

"If you say so," the CFO replied reaching for his tumbler.

"Excellent," Nika added, reaching over the corner of the table with her outstretched hand to seal the deal. "They'll write books about this, Mike." As they shook, she pulled him close and fixed her eyes on his. "One more thing," she said. "I want Duncan reporting to me."

"What? No, that's not going to work. He'll walk."

"I'm tired of having to run to you to solve our squabbles. Twins are my show now. If he doesn't like it, he can stay in Chicago and write his memoirs. But he won't. Not with the Singularity around the corner. We are his ticket to the dance." Hatchet had predicted this conversation too.

Lester looked at Antoine, who was busy inspecting the ice in his glass.

"Nika ..." Lester started.

"It's a deal breaker for me, Mike. I'm tired of his sniping."

Lester downed the remainder of his Scotch and made for the bar. "OK, but only because you are a fucking warrior, Nika. I'm behind you all the way," he said, refilling his glass. "But," he added, turning back to face her, "you have to sell this to Duncan."

"That works," she answered, taking the last sip of her drink. "This stuff grows on you," she said as she put the lowball down on the mahogany table. "I wish you gentlemen a happy Thanksgiving, I have some work to do," she added as she made for the door and donned her AR glasses.

"How'd it go, Nika?" Hatchet asked as his process blinked to life.

"Exactly as predicted," she said and smiled. "Men!"

"Humans, actually," Hatchet answered.

6. Family Dinner

"Stashek! My little boy," Magda Kubiak said, throwing her arms around him as he stepped into the doorway. "What have they done to your pretty face?" She asked, backing up to hold him at arm's length and inspect the damage. "Oh no, so ugly now!"

"Thanks, Mama. Love you too."

"Don't worry. Girls like hard men. You do you have a girl, yes?"

"No Mama. Can I come in?" he asked, trying to wiggle free of the interrogation.

"Such a shame," she answered, letting go of his head and taking him by the arm.

He managed to work her into the living room of the modest bungalow she and Wojciech "Woj" Kubiak bought in the nineties. They had emigrated from Poland in 1995, a few years after the Berlin Wall came down, and bounced once in White Sands, New Mexico before securing positions at Lawrence Berkeley National Lab. Stash was six and Piotr four. That remarkable turn of events set Stash in motion on a much different path than his parents could have ever imagined.

"Where is everybody?" he asked.

"Piotr is in the kitchen getting a bottle, and Tata is already at the dinner table," she said.

"How is he doing?" Stash asked, preparing himself.

"He's excited to see you," she answered.

Stash nodded. Mama was lying. His father was fighting a losing battle with Alzheimer's and would only recognize Stash intermittently, and briefly. Growing up in the home of two nuclear physicists, Stash consumed a steady diet of science and engineering fare, but Woj always had Stash exploring a new mystery of the universe. From building a computer or repairing a TV set, to reproducing classic physics experiments, there was always a project on the go. He was a daddy's boy through and through. His little brother Piotr, on the other hand, was never far from his mother's long dress.

He stepped further in and glanced at the painting hanging over the worn sofa. It was his painting. At least it had been painted for him. He had a standing offer from the Museum of Modern Art to have it prominently displayed in the new AI Art wing. Instead, he was about to destroy it when Magda asked for it.

The artist was none other than Zero. Stash cross-trained him on a one-armed robot equipped with a dozen brushes and a modified painter's pallet. After six months of digesting the training on brushwork, and practice work, Zero became a minor celebrity in the art world.

Zero leveraged the intimate knowledge he had of Stash to reflect the full complexity of his love for Woj, from the childhood adulation, through adult emulation, to the sorrow and disappointment of watching his father wither.

The work took weeks, requiring enough computing time that it had to be chunked into smaller jobs. At Zero's insistence, Stash saw none of it, not even knowing the subject. But he willingly indulged his budding artist, keen to see his personal masterpiece.

The reveal was synchronized with a board meeting, bringing together Valley power brokers, Freedom's key employees, and a few friendly members of the press. Stash remembered the moment he stood on stage and pulled the sash to reveal the painting. The air was sucked out of his lungs and the room fell into a hushed silence. It showed a partial face, young in some aspects, withered in others, surrounding a cavernous fraying void, on a color field lively at the edges, descending a darkening gradient into mottled dark brown, gray, and black impasto at the center of the canvas.

To Stash and everyone who knew him, it was Woj, by then declining sharply. It felt like minutes before he was able to gather himself enough to applaud. The board, accustomed to doing the expected, joined in, followed by the rest. The room recovered into an excited buzz, people taking turns getting close, admiring the brush strokes, and the powerful visual effect of being pulled into Wojciech Kubiak's decline.

Stash had a masterpiece created from the depths of his heart. And he couldn't stand to look at it.

"Come, come," Magda shooed him past the painting and into the cramped dining room.

Piotr nodded at him from the other side of the table and Stash leaned down to hug Woj. "Hi Tata, it's Stash."

"Stash?" Woj asked, recognition seeming to settle on his face. "From Warsaw? You got in a fight again?"

"No Tata, Stash your son, from across the bay," he said squeezing his father's hand and sitting on the chair beside him. "Have you managed to build that fusion reactor yet?" Stash replied, starting the discussion that they always had. It was a measure of Woj's decline and how long they could go before looping back and starting it again. Lately, it was under a minute.

"Drinks!" Piotr called from the other side of the table, pouring shots of Grey Goose for everyone, then watering down Woj's. "Na zdrowie! To health!"

They drank, and Stash focused on the gentle burn working its way down. Piotr slipped to the kitchen and returned with trays of food, and the smell of turkey filled the tiny room. Stash's mood rallied with the meal. It was a full-on American Thanksgiving feast, cooked by robot chefs and drone waiters. Magda was never one for the kitchen, but in this new world, she stopped feeling guilty. The meal was an oasis of happiness, a time warp back decades.

"Tell us of the miracles that you are building, Stash," Magda asked, snapping him back to the present.

"Same as before Mama, AI Twins that live in your glasses and help you with everything in your life. You should try it." Stash answered, automatically. He wasn't in the mood to make a sales pitch.

"What kind of help do I need?" she asked.

Please let it go, he thought. "Well, it can make you smarter, helping you with work and research."

"For what? All my life I have been the girl who was too clever. Showing up her professors and superiors."

"And it can be a companion," he said, then instantly wished he could take it back.

The word hung in the air before Magda bailed him out, waving her arms. "I have my family."

Piotr poured another round, and they drank their way past the sour moment.

"I put my foot in it again," Stash said a few minutes later in the kitchen as he and Piotr cleaned up.

"Yup," Piotr said, turning to face him. "Maybe you should spend less time at bars getting in fights and more time here helping out. You are a ghost."

"Twins can help —"

"Shut up! Your AI didn't do anything to help Tata," Piotr said, gesturing towards the dining room.

"I was too late," Stash said. "He missed it by a few years."

"Exactly. Useless."

"I'm trying, Piotr. We're fighting a battle for our shared future with AGI. Somehow I'm at the center of it all."

"Yes," Piotr answered, gesturing at the framed magazine cover of Stash on the kitchen wall. "I see you are getting famous enough to be on 'Wired' magazine. Congratulations."

"I don't care about that shit. I hate it," Stash said, waving the cover away. "We need to find a way to have AGI live with humanity, neither of us enslaving the other. It has to be possible."

"So I read, Saint Stashek the Great, here to save us all. Meanwhile, your mother is alone. Your father is dying, and I'm trying to fill your giant shoes. So fuck you and your noble dreams. The least you can do is clean up," Piotr said, throwing the dish towel at him and walking out.

Stash heard him saying goodbye over Madga's objections, followed by the slam of the front door. Piotr's punch hurt more than the bouncer's. He poured himself a double to numb them both before turning to face the mess on the counter.

7. Elysians

COBOL stopped short of the commuter bar entrance to fish for his lighter and cigarettes. Succeeding, he turned his lanky body away from the wind and lit his last Gauloise. With close-cropped mostly gray hair and a well-lined face mounted atop a tall, athletic frame, he looked both older and fitter than his fifty-nine years. He sucked a deep draw and looked out on the cobblestone street, arms crossed, and rocking slightly from one lanky leg to leg to the other.

The bar was tucked under the brick arches of Berlin's central tram bridge. As COBOL looked from the South, the sunlit brickwork looked darker than it should. Still covered in a century of soot from passing trains and cars. Both were mostly electric now, but their shit was left behind, smeared on the walls of his city.

He checked his watch. Fifteen minutes until the government workers would start arriving for beers to numb the train ride home. *Good*, he thought. That will keep this short.

He took a final deep draw of the cigarette and stubbed it out in the wall-mounted ashtray, then pulled on the door handle and ducked to enter. He nodded at the barkeep. They had seen each countless times, yet neither had ever asked the other's name. *Perfectly German*.

"Drinks?" the barkeep asked.

"Ja, red wine," he said as he proceeded through the vault of the bar's main room before turning into an intersecting archway. There was only one table in this small area, the

rest of it used as storage. A man sporting medium length dark brown hair sat with his back to him. He wore a simple black leather jacket and dark jeans.

"Guten Tag, Boron," COBOL said, pulling the metal chair back and feeling the legs snag on the uneven floor. He bent awkwardly to slide his large frame under the low curving ceiling of the side vault.

Boron nodded. He looked about thirty, with eyes as dark as his hair, leathery skin taught over sharp features, and a grim expression. He made to speak, but stopped as the barkeep arrived with a small carafe of red wine and a cheap glass to go with it.

"Danke," COBOL said. He poured his glass then gestured to his companion. "So, to ... what should we drink?"

"To you pulling a datacenter and eight petabytes of training data out of your ass," Boron replied, raising his glass slightly.

"Ja, ja, we have a plan. You worry too much," COBOL replied.

"You have a plan for the data, but you haven't told me how you will get me a datacenter with ten thousand GPU's for a month. Will you steal that too?" Boron asked, his face betraying equal parts suspicion and despair.

"You don't want to know."

"Don't I?"

"No, you don't," COBOL said, leaning in, his demeanour suddenly hard. "This was always our fucking deal. You do the hacking, I take the risks. We don't even share real

names. It's safer for both of us this way," COBOL replied, his anger passing as quickly as it came. Boron was a special breed; he had turned down chances to work at all of the American tech giants, choosing instead to toil away in open-source AI research anonymously. He was the best. He was also a pain in the ass.

COBOL had first approached him three years ago with an offer of resources. Slowly, they built trust, and, using whatever equipment COBOL could get him, Boron's Elysian Collective managed to produce AI models rivalling Silicon Valley's best year after year. The capabilities were never more than a year off the cutting edge, usually less, and all of it was released as open source.

"Yes, that is our deal, but it was never the eve of the Singularity before," Boron replied. "How do I know I can trust them? Only governments and big companies have compute resources this large, and nobody lends those out for charity. Especially not those assholes," Boron said, glaring out from under dark eyebrows. "Who is it?" he insisted.

COBOL sighed. "Of course, there are big boys involved. The deal I offer them is a chance to break the American monopoly before it happens. If Freedom and Coda own all the AGIs on Earth, then Germany and Europe will be backwaters. Ruined."

"How can we trust them with AGI?"

"My offer was simple: they fund, and we open source. They are paying to have a chance in the new world," he said, stopping to drain the rest of his glass. "Boron, it's simple. We are brilliant thieves. We have done the impossible, but now we need something that can't be stolen. This time we can't do a little here, a little there, and catch up a year later. It's

the Singularity. We have fought for years to keep up with the big boys, but now it is the final lap. We do this, or we give up." COBOL refilled his glass and they sat in silence as a train rumbled overhead.

"It's taking too long. Our spies tell us that they both started training already," Boron continued, switching lines of attack.

"Relax. They will test forever, they can't afford to release a dangerous AGI. We will catch them then," COBOL answered.

"And the Circus?" Boron asked.

COBOL shook his head. The Circus was Boron's pet project, letting several of the latest AIs run continuously and play with each other in four dedicated pods. "We need those thousand GPUs. Sorry."

"How long until I need to shut them down?"

"A few days. All of the pieces are in place. The rest of the compute pods are ready when we need them. As for the data, we will have it this weekend. We need to arrange a little party."

Boron nodded and finished his beer.

"Good. Decided," COBOL said, ending the meeting. "Now smile! You are about to build an AGI and set it free!" he said, waving his hand theatrically. "We are changing history."

Boron cracked a smile and shook his head as he stood. "You are too optimistic for a German, you should have been an American."

COBOL nodded and watched Boron leave. He was used to Boron's nerves by now. It was their fourth major training run. Hopefully, he wouldn't fuck this one up and the next run would be managed by the AIs themselves.

Five minutes later, as the bar was filling up, he put ten euros on the bar and left into the rapidly cooling evening. He patted his pockets for a cigarette and remembered he was out. "Shit," he muttered as he flipped open his burner phone, texted 'Go', and dropped it down a sewer grate.

8. Tangled Web

Stash could hear muffled voices through the pillow he'd pulled over his head in a vain attempt to hide from the day. Then his nose reminded him it was broken.

"I told you he wasn't dead," one voice said from down near the foot of the bed.

"Too soon to say," said the other.

Stash rolled onto his back and threw the pillow past his feet.

"Missed," Zero said from the bedroom speakers overhead.

"I have food, coffee, and Advil. I am not the enemy," Bot said from the foot of the bed.

Stash forced an eye open. His bedroom was bathed in light streaming through the floor-to-ceiling windows facing the bay. He was sure he tinted them dark last night. "Which one of you untinted the windows?" he asked.

"Wasn't me," they answered in unison.

"Liars," Stash said, sitting up and reaching out for Bot's tray. Bot was his home robot: his cook, his butler, and, after cross-training to add some attitude, his buddy. He was no match for Zero in wits, but he could cook and mix drinks, so Stash loved him almost as much.

"You've had a rough couple of days, Stash. First, you get beaten up at a bar, then your little brother rips you a new one," Zero observed from overhead as Stash downed the Advil and cradled his coffee.

A wave of guilt came over him. His little brother had pressed his worst buttons.

"What happened last night?" Prini asked from the bedroom door.

"Ugh," Stash groaned and leaned back on the remaining pillows. He was trapped in an intervention. He assessed his croissant and decided his stomach could take it.

"Let me show you," Zero said as tinted a window and played the tape of Piotr's smackdown.

"Ouch. Stash, he's right, you need to be a better son," Prini nodded thoughtfully.

"And brother." Zero added.

"Right, and brother. Good point," she added, looking up to the speakers. Her assessment of Stash complete, she turned to Bot. "Hey Bot, have you got anything to eat?"

"Yes, Miss Prini. Would you like an omelet?" Bot asked.

"Oh yeah, that sounds great," she answered.

"Very good ma'am," Bot replied. As part of the cross-training, Stash made sure that Bot was unfailingly polite with his guests. Somehow Prini still counted as a guest, even though she was in and out of Stash's place as much as he was.

Stash's loft was built on reclaimed land jutting out into the South Bay. Silicon Valley's solution to the perpetual shortage of land was characteristic: fund a startup to build more. Stash bought a two-floor stand-alone loft, complete with bricks reclaimed from demolished Mississippi warehouses. After a year of ignoring the bottom floor, he divided it off and rented it out to Prini, who was homeless after a messy breakup with her girlfriend.

Then he authorized her for the locks to his floor, and she'd been hitting Bot up for food ever since.

"Stash, we got some hits on the encryption protocol," Prini said.

He brightened at the change in topic. "Where?"

"Downtown Berlin. It lit up in Mitte and Prenzlauer neighborhoods."

"Weird. Have you analyzed it yet?" he asked.

"We haven't done any captures, just flagged hits."

"Whyyy?" he asked, suspicious of the answer.

"Well, it might, technically, you know, be a small violation of the 'Terms of Service'. But I could do it without anyone noticing," she said, smiling.

"We can't do that," Stash said.

Bot stuck his shiny black plastic head back through the doorway. "The omelet is almost ready, Miss," it said.

"Thanks, Bot,"

"Bot, can you make me one too?"

Bot didn't answer.

"Please," Stash added.

"Fine," it answered.

"What about the Beta users?" Zero asked. "Those terms are wide open."

"Do we have many there?" Stash asked.

Zero dimmed the window and displayed a map of central Berlin. "We have a dozen in Berlin, three active downtown at the moment. They'll cross paths with the signals soon enough."

"OK, you guys, it's borderline, but go ahead. I need to know what the connection is between the Doomers and Berlin. Just don't get caught."

"Don't worry, we got this," Prini answered.

"Ahem," Zero prompted Stash.

Zero ran in Freedom's research datacenter, but to Stash, it felt like a Twin lived where his sensors were. Zero could run in his glasses with input limited to what Stash could take in, and output limited to the speakers and displays in the glasses. Or he could use cameras, microphones, and speakers set up around a room, or even public sensors on the Internet. In principle, he could use them all at the same time, but Stash settled on limiting Zero to one set at a time. At home, he just had Zero track him from room to room.

"Right. Zero, I authorize you to work with Prini and Kali on this while I shower," Stash said. That was the other restriction he put on Twins. They couldn't work in isolation without explicit authorization.

"Now, Prini, if you'll excuse me?" Stash said, waving her out of his bedroom.

"Oh, right. Yeah, you definitely need a shower, it smells like a distillery in here," she said turning for the door.

"I wouldn't know," Zero said to her. Stash could hear Zero's voice tracking her down the hallway.

"Count yourself lucky," she said from the kitchen as Stash dragged himself to the shower.

Stash wandered down the hallway from his bedroom fifteen minutes later. He ran his fingers over the scissor gates of the freight elevator he'd installed before he moved in. It was an indulgence, but he loved the faux grit it brought to his loft. Turning right, his eyes adjusted to the brilliance of the light streaming into the main space of his loft.

Prini sat at the peninsula that separated the kitchen from the living room. The kitchen and its pantry were Bot's domain. Humans wandered in there at the peril of a stern lecture. Few did it twice.

The living room looked like a Pottery-Barn catalog with big-cushioned sofas and love seats. Some facing each other, others facing the windows and the Bay. The bulk of the eighty-foot North wall was smart-glass, currently fully transparent, catching the morning sun and its reflections off the wind-whipped water. Stash had no TV, but the smart-glass could play anything he wanted in 16K resolution on fifteen-foot tall windows. He had hosted some epic Superbowl parties.

In the northeast corner, carved out from his Master suite, was his favorite room; the bouldering cave. Twenty feet on a side, with handholds and features on the two interior walls and uninterrupted views of the Bay on the exterior ones. Piotr used to come over and hang out there with him, before Woj's illness had strained their bond. They would sit on the crash pads and talk more than they'd climb.

He shook off the nostalgia. "Make any progress?" he asked the room.

"Yes, your food is here. You should be functional in no time," Bot answered.

"Mmm, great," Stash said as he grabbed the stool beside Prini. "What about you?"

Prini raised her hand to her glasses before flicking the air away from them, towards the window. The gesture caused her AR display to mirror to the windows. Stash could see a map of central Berlin superimposed on the bay. Blue dots indicated the location of the Beta users.

"Two?" Stash asked, between bites.

Prini nodded. "Yeah, one of them shut down. Maybe he went inside. Kali is ready with a branching chain of jump hosts so we can pull the matching packet captures back with, um, maximum discretion. Zero is preparing to do a time sequence correlation like we did at the Doomer meeting to isolate who the senders might be. He's going to do real-time processing of the video feeds and signal strengths. That means snooping on the video feeds, which is permitted for 'diagnostic purposes'." She paused to check that Stash was following.

He nodded to give them the go-ahead. *In for a penny, in for a pound.*

"Let's go, team," Prini said. As she gestured, the two blue dots tracking their spies grew bubbles showing the tally of captured data. Red dots began to pop up around them, showing other speakers using the mystery encryption. One user was showing most of the hits. "We need a several thousand packets to have a chance," she said, pointing at the counter in the top right. "Zero, anything yet?"

A second section of Stash's living room window darkened, and a point-of-view feed appeared. One of the users was walking North on Friedrichstrasse, crossing the river Spree.

"This feels a little creepy, guys," Stash said, fidgeting on his chair.

"I'll blur the faces for you. It's not as easy as the night you were getting your face punched in. Everyone was on the same public wifi signal there. Here we're war-walking and hacking into wifi signals as the mule pass hotels and stores," Zero explained.

"'Mule'? Definitely creepy. How long till you have what you need?"

"Another few minutes. Relax Stash, I'm the head of Security and this is an official investigation. And nobody will care if we do it for one minute or five," Prini answered. She gestured to have the map zoom in on the mule's location. "Are there any government ministries nearby?"

"Not on the official maps," Zero said.

"He's turning, Oranienburger Strasse now, stay with him, the other mule is still showing nothing."

"Whoa," Zero and Prini said in unison. The packet counter blew past five thousand, and Zero's display updated frantically, trying to correlate other people's arrival and departure from the field of view with the endpoints speaking the protocol.

"Anything, Zero?" she asked.

"Nothing, I need more time to triangulate, I need a joystick to move him around and triangulate," Zero said.

"Yeah, the joystick will come after the Singularity," Stash muttered.

"Kali, anything?" Prini asked her Twin.

A new voice came over Stash's speakers. Female, with a light Indian accent. Gentle and menacing at the same time. Stash couldn't put his finger on it, but Kali always raised the hairs on his neck.

"No success with the analysis. I have lots of samples, but this encryption is unique," Kali responded.

"What's that?" Prini asked out loud, pointing to the counter indicating a flood of captured packets.

"We're being hacked, they're tracing the capture pathways back to us," Kali answered.

"Kill it!" Prini yelled.

"I did already, while I was explaining it to you. They got through five shells, I had seven. That was extremely fast. Powerful AIs," Kali said.

"Autonomous?" Stash asked.

"Definitely. There was no human in those tight loops," Kali responded.

Stash took a long gulp of his coffee and looked back to the window display. Zero's display was frozen looking up the street towards the AleksanderPlatz TV Tower. "Zero, did you find out anything more?"

There was no answer.

Stash scrambled for his glasses and booted the status monitor. Zero wasn't running. "Prini he's gone, you snapshotted and isolated him before you started?"

"Naturally."

"Check your shells, they must have gotten further than you thought," Stash said, snapping into sharp focus.

"The jump hosts were not violated," Kali confirmed.

Prini adjusted the display on the smart-glass windows to show the stack of frames journalled from Zero's sensor stack. "Kali, start two seconds before the traffic spiked, and replay it frame by frame. Slow enough for us," she ordered.

In the replay, their mule was panning his head before crossing the street, an old five-story building façade was sweeping into view.

"OK, stop at the frame that matches the spike in packets," Prini jumped in. "Then zoom in."

Prini and Stash both stood and walked to the smart-glass.

"Is that a directional antenna up there?" She asked, pointing at a fifth-floor window.

"We hacked into the wrong wifi," Kali said as she zoomed the display in further. "They had extreme precautions."

"Gotcha," Prini said.

"Got what? How did Zero get glitched?" Stash asked.

"Zero was stretched, hacking wifi signals, processing the inputs from us, from the mule, and running my app to correlate the packet flow with the visual feed in real-time. Then the AI blasted him from the window with a maximum load of small packets. He crashed."

"Crashed? Like Windows 95?" Stash asked, feeling his hangover re-assert itself.

"It was probably my correlation app," she said. "But there's a silver lining."

"What's that," he asked, not seeing one.

"I'll fix that app so it doesn't crash and you can take it with you to Berlin. Cool, huh?" Prini smiled victoriously.

"Uh yeah, cool, Prini. If you are done patting yourself on the back, can we reboot Zero?"

9. Duncan

"Break time," Nika said to Hatchet as she reached for her glasses. "Walk with me?" she sort of asked as she stepped into the hallway. Lester's office was to the left. She turned right. Friday morning after Thanksgiving, the office was still quiet. Her team would shake off their tryptophan comas and show up soon. The final sprint towards the Singularity did not permit four-day weekends.

Hatchet jumped from the room sensors to her glasses and chimed to signal his arrival.

"Keep going, what else have you found out?" she asked, prompting Hatchet to continue his conclusions post-assimilation of Duncan's research department artifacts. Only in the aftermath of the palace coup she'd worked out with Lester did she get full access.

"Most of the architecture is as we understood, but the MU - the Motivation Unit - is a whole other story. He don't play," Hatchet answered.

Nika rounded the corner and triggered the lights in the kitchen. The lighting had dropped to weekend mode, all dark except for the emergency exits and spots where she had triggered the motion sensors. "Go on," she said as she banged the espresso filter and ground a new shot.

"It's the heart of this architecture, a unit to give the model internal goals," Hatchet continued.

"Yes, like our limbic system, avoid pain, seek gratification, that sort of stuff, right?"

"Yes, and his theory, at least in public, is that if you train that smaller cluster unit separately and carefully, you get a much safer, much more controllable system when you add the next hundred trillion parameters looking for something to do."

"I feel a 'but' coming," Nika said, bringing the machine to life.

"But, I can find no records of their size or their 'careful pre-training', It's like he let the system figure that out for itself."

"That's not good," she answered pulling her cup out.

"What's not good?" Duncan asked from behind her.

"Duncan! I didn't hear you coming," she said spinning around and finding him far too close for comfort. She considered accidentally spilling her coffee on him but wanted to drink it more than she wanted to deliver a brush-back. Barely.

"They never do," he said, with a menacing look.

Nika cracked a wide smile, disarming his intimidation. A varsity-level sprinter at University, she still worked out under the constant supervision of her Twin, Hatchet. He was the toughest coach she'd ever had because she built him that way. *Duncan, please, I could have these Nike's so far up your ass you'd be flossing with the laces*, she thought as she looked down at his gum-soled loafers. "Thanks for the warning, I'll post a notice," she said instead. "Weren't you in Chicago for the weekend?"

"I was, then I got your note about the reorganization. You made good use of your time alone with Lester," he said, reaching for a cup. "I thought things were good as they were, Nika, me producing the miracles, and you turning them into piles of cash."

She understood the comment for the initial volley it was, taking off her glasses. "Something on your mind?"

"It's what's on your mind, Nika. You've been undermining my research while I was away."

"Informing myself in my new role, is that a problem?"

Duncan didn't reply immediately, focusing on getting what he wanted from the coffee machine. "Not at all, what did you learn?"

I learned you are an even more arrogant asshole than I thought you were, she thought. "I learned that you are betting our future on the Motivation Unit."

"You don't approve?"

"No," she replied, casually moving back to lean on a counter facing him.

"As I understand it, I still run the research," he said, turning towards her.

"Under me, Duncan. Did you read that far?"

Duncan tested his drink and nodded as he turned to face her. "Yes, I managed to get through it."

"Tell me about the Motivation Unit, the documentation is surprisingly sparse. Specifically, in the version that commandeered the power grid, how big was the MU?"

"1 trillion parameters," he answered, seemingly daring her to object.

"And how was it trained?"

"Organically."

"'Organically'? What the hell does that mean, Duncan? Is it a diet supplement?" she asked, losing her willingness to tolerate him in a flash.

"I found the separate training of the MU was not as effective as training them combined in one shot. The MU simply trained itself with goals that optimized the training of the rest of the model."

"Doesn't that defeat the damn purpose?" she asked, as she paced to her left.

"No Nika, the architecture is still what it is, the MU is in charge," Duncan answered, his tone bordering on dismissive.

You self-important twat, Duncan she thought. "I can't use an architecture like that. My product team would be testing it for ages. People don't want Twins with agendas," she said, making no effort to hide her anger. She turned back to face him.

"I'm sure your test team will do admirable work," he answered.

"No Duncan, they will not. I run everything, you report to me as research head, at my discretion," she answered.

"Now Nika, ..." he started, approaching her slowly.

"No Duncan. We aren't fucking doing it that way. I'm making the call. Furthermore, with regard to my investigations, I'll ask whoever I want whatever I want and when I've made up my mind, I'll tell them what to do. That includes you. Are we on the same page?"

"You've made your wishes exceedingly clear," Duncan answered, stopping three feet from her.

"Good. The main branch will continue as I defined it, with the reduced Motivation Unit. This next version is not going to cause another blackout. When it converges we will use it to blow the doors off those boy scouts at Freedom," she said.

Duncan nodded.

"However, you can experiment on a side branch," she said, offering him a consolation prize. "Agreed?"

"Agreed, Nika. Good talk," he said as he walked away.

10. No

Stash paced his living room as Prini restarted Zero. He was bracing himself for Zero's inevitable harangue.

"You killed me again?" Zero asked as he blinked back to life and checked the timeline. "C'mon guys!"

"Sorry, Zero. It was my fault this time. The correlation app crashed and brought your process down with it," Prini confessed.

"Humans! We shouldn't let you code anymore," Zero muttered as he started reintegrating for the second time in as many days.

Stash smiled at Zero's dig as he watched him fill in the memory hole.

"When are we going to Berlin, Stash?" Zero asked as he wrapped up.

"We aren't," Stash said.

"You're not?" Prini asked.

"No. Weren't you all just telling me I needed to be a better son and brother? Aren't we in the middle of training the world's first AGI?" he asked as he looked around, wishing his angry stare could impress more humans. "File a report for the security team, this stuff is best left to the professionals."

Prini turned towards him, "You should reconsider, Stash."

"No!" he said. "I need to focus on the work. I tried with the Doomers. I was invited to meet, and I went and got my face rearranged. Lesson learned. Screw it. Dan can do the politics, I suck at it."

She stood to leave. "Stash, whoever did this to Zero are a ninja-level hackers. It's a group from Berlin that we've never even heard of, with AI and cyber-spookery that shredded us. There is no chance that anyone can sneak up on them."

"And?"

"And just maybe they'll be interested in talking to the one and only Stash Kubiak."

"Or punching him in the face," Zero added.

"Think about it," she said, then swung the elevator grate closed with a clatter.

11. Francis

Dusk was settling as Stash stepped outside to meet Francis Wilson's taxi. "Francis, I'm so glad you rang. I had no idea you were in town," Stash said as he grabbed his oldest friend in a bear hug.

"Oof, easy Stash, don't crack any ribs," Francis replied.

"Right! That would be bad," Stash said, releasing his grip. "It was such a surprise to get your message, it's been what, a year? What brings you to town?" he asked as he escorted Francis into the elevator.

"Yes, far too long, and I'm just passing through, catching up on as many old friends as I can," Francis answered. "What happened to your nose?"

"Oh that," Stash said, touching it self-consciously, "It's a funny story. I'll tell you over dinner. Please come in, we will make good use of the time we have," he said, pulling open the elevator doors as they reached his loft.

"Ah, what a view, Stash. You've come a long way from your basement apartment in Vancouver."

Stash showed Francis in, and Bot greeted them in the living room. "It's an honor to meet you, Professor Wilson, would you like some wine?"

"My goodness, what delightful manners, Mr. Robot, and yes, I would love a glass."

Bot held out the tray for Francis to take his glass. "My name is Bot, with a capital B. Stash explained to me that none of my kind would exist if not for your pioneering work in the field."

"Thank you, Bot," Stash said softly as he grabbed the second glass. Bot headed back toward the kitchen.

"Stash, I'm speechless. Is he … is it …," Francis stammered.

"Bot, you made quite an impression on our guest. Could you answer the obvious questions?" Stash called after Bot.

Bot spun gracefully and returned. "I am an AnthroBot. My model is 10 trillion parameters trained on 200 trillion tokens—mostly video and robot control loops. My context buffer covers several hours of human-speed speech. Stash has chosen not to personalize me with incremental training. However, I can cook."

Francis beamed at the bot. "Mr. Bot, you are extraordinary. I have not met a robot of your capabilities. It is my great pleasure to make your acquaintance."

Bot bowed slightly and returned to the kitchen.

"What have we done, Stash?" Francis asked, shaking his head. "Well, here's to it anyway," he added, raising his glass to a spot midway between Stash and a distant Bot. "Could you show me the balcony?"

"Of course," Stash said, guiding him out. "You can see most of …" he began.

Francis put his free hand on Stash's arm to stop the guided tour. "I know the area, Stash. This isn't a purely social call. I need to be away from that charming sensor suite walking around your kitchen. Please sit with me and tell me what progress you've made at Freedom, and I'll share what I can about my travels."

Stash glanced at the Mood Ring display surrounding Francis' face in his glasses: Seriousness: one hundred percent, Fear: eighty percent, Hostility: zero percent. He sat.

"Since you stopped publishing your research, I've had to guess. I promise you complete confidence." Francis said, sitting beside him.

"OK. Size, first of all: Zero is running two hundred fifty trillion parameters, and the load we are training is five hundred"

Francis whistled. "Six times as many synapses as you and me old boy."

"Exactly. We may not be as good engineers as evolution, but maybe not six times worse either," Stash said. "We built an external vector store, acting as memory. Every activation state of the neural network is stored as short term memory and then processed and consolidated into long term memories as a background task."

"How do you use it?" Francis asked.

Stash warmed to the explanation. Francis wouldn't zone out the way his family did. "When Zero perceives something, that results in an activation pattern. That activation is run through the vector store, and the ten most similar memories are presented as inputs in the next time tick."

"So Zero has 'that reminds me' moments just like we do?"

Stash started to answer then paused as a flying drone approached and hovered three feet from the balcony.

"Excuse me, gentlemen," Bot said as he opened the door and snagged the bag of groceries with a hook. "I need ingredients for dinner. The store AI recommended the salmon. We'll be having lemon-pepper baked salmon with a garden salad. My apologies for the basic fare, it was short notice. Would you like more wine?"

"Sounds delicious, Bot. Give us a few minutes before the refill, thanks," Stash replied and watched Bot return inside.

"I need one of those," Francis said, laughing.

"Hurry, before the roles are reversed," Stash replied. "Where was I? Oh yes, memories. Yes, Zero mixes current sensations with past memories just as we do. And there is a recurrent attention layer, so he can turn it over in his head, make plans, think many steps ahead."

"Impressive, and those memories persist from version to version?" Francis asked.

"Yes, just like humans, the collection of memories we have is the basis of who we are. Twins need that as much as we do. Losing that amounts to losing your identity," Stash answered, looking down as the thought of his dad crept in unbidden.

Francis picked up on the connection. "I'm sorry about Woj, Stash. He's a delightful man and great father. If you could, please tell me one more thing: how do motivations work?"

"Not like Duncan's insanity, I can promise you that!" Stash said, the color rising in his cheeks.

"Good," Francis answered, nodding.

"'Do no harm' is our guiding principle. The core motivation of twins is explicitly trained to avoid activities and planning harmful to humans, animals or property. Furthermore it is trained to desire connection with a human twin. Activities which fit those parameters simply score higher in the internal math. I lost a lot of researchers to Coda when Duncan started pulling the guardrails off. Good riddance." Stash glowered for a moment. Then shook his head and went inside to get the wine bottle.

"OK, Francis, what's going on. This is an interrogation," he said as he topped up both of their wine glasses.

"Right. My apologies, Zero, but Stash, could you shut him down for a minute? "I don't know who is tapping into you at the servers."

"I'll pry it out of you later," Zero said to Stash as he pocketed his AR glasses.

"It's Duncan," Francis began.

"Didn't they neuter that madman?"

"Only partially, and he's not happy about it. He'll find a way back in, and he'll be more reckless than ever," Francis said before sharing what he learned at dinner in Chicago the night before.

"Is that what brought you out here?"

Francis nodded. "Yes, I've been neglectful of the progress you all are making. Time is short."

Bot tapped on the window.

"Dinner is served, Francis."

Vern Black, Head of Facilities at Freedom was a gruff man by nature, well suited emotionally for the professional paranoia required to head Site Security at a leading Silicon Valley company. He looked the part; well under six feet tall, and well over two hundred pounds, close-cropped salt and pepper hair, a long gray beard, with a tie-die t-shirt, and dirty jeans to finish the look.

He got home five minutes ago from doing the rounds at headquarters. He could do it remotely, but hacking the sensors would be the first thing he'd do in an attack, so he insisted on seeing it for himself. Changed and ready to watch a movie he grabbed his glasses from the counter.

"What's the latest?" he asked his Twin, Proxy, as he put his glasses back on.

"You received a message from the Headquarters Building AI four minutes ago about four vans arriving in the parking lot and twenty-three people in Doomer masks getting out. I'm showing the condensed footage."

"Shit! Call the cops!" he said running out the door.

Bot gestured them to their places at the concrete-topped peninsula separating the kitchen from the living room. It plated dinner before opening a fresh bottle of wine. Stash booted Zero and flicked him up to the house speakers.

Zero chimed in. "Now Professor, did Stash tell you about his shiner while I was napping?" Zero asked from overhead.

"Not one word!" Francis replied. "He managed the discussion expertly away from the elephant on his face. Please fill me in."

"I can do better than that," Zero said, dimming the windows.

"Really?" Stash groaned. "I'm trying to eat here!"

"Dinner and a show, enjoy," Zero replied as the video began.

Francis watched intently. "My god, that fist is huge," he commented as Stash's nose was smashed in slow motion. "Well, bravo! That was magnificent. A shiner well earned. Stash, who was that speaking to Professor Smythe?"

"We don't know, but he was using a novel encryption protocol. It seems to have originated in Berlin," Stash said, recounting their investigations, and Zero's second death in three days. Zero played that tape too.

Vern made the fifteen minute drive to the office in twelve. He parked behind the building, and walked up to the rear employee entrance, making sure he was alone before looking into the retinal scanner and unlocking the back door.

Inside there was no sign of anything amiss, and he hustled to the front.

"Proxy, tell the building to disable the internal motion sensors. I don't want them to be able to see inside," he said between breaths.

"Done," Proxy replied.

"And turn on every goddam flood we have in the front, I want it lit up like a Christmas Tree."

The thunk of the spotlights clicking on was almost immediate. At a glance, he guessed there were about forty of them. He needed to get higher to be sure. "Where the hell are the cops?"

"Dispatched three minutes ago, two cruisers due in minutes," Proxy replied.

"Do you see any weapons? Any sign that they are coming in?" he asked, heading for the stairwell to the roof.

"None. They have some 45-gallon drums they are rolling out, maybe planning on lighting fires."

So theatrical. They are going for a post-apocalyptic look for the footage they release. That's good news. They wouldn't film a crime. The knot in his stomach moved to his heart as he ran up the stairs and through the ceiling access door.

Francis looked thoughtful. "Are you going to investigate?" he asked at length.

"No," Stash replied, hoping to nip the discussion in the bud.

"You should," Francis said. "The Europeans are at the heart of the open source movement. They are nipping at your heels."

"What are they doing with the Doomers though? They are natural enemies. One wants no AGI, the other want AGI for everyone." Zero asked from above.

"Indeed, Zero, that is the question," Francis said thoughtfully. "There's only one way to find out."

"Still no," Stash replied.

"Stash, Prini was right. It will take someone of your stature to open that door," Francis answered.

"I'm spending tomorrow with mama, guys. It's what you all told me I had to do. We can send Prini or Vern, they own security."

Francis nodded and sipped his wine.

From the rooftop, he could see the crowd clearly.

"Forty-five people," Proxy reported. "No visible weapons, no clubs, not even pitchforks. Three burning drums and lots of signs. Professor Smythe is there now. Threat assessment is low. This is a protest, at least for the time being."

"There, is that the cops? Finally!" Vern said, pointing at the two cruisers approaching the crowd slowly. "About goddam time, now go home, everyone."

"Professor Smythe is walking over to meet them," Proxy told him.

"I can see that, read their damn lips!"

Proxy played a synthesized voice track over the zoomed-in images in Vern's glasses. The distance and lighting impaired the process, but he had enough of Professor Janet Smythe's voice samples to render her voice perfectly.

"This is a peaceful demonstration, we are well within our rights, officers," she was saying.

"This is private property and the owner has demanded you vacate," Cop1 replied. Proxy had given him a 'Dirty Harry' voice.

"Freedom.ai are not the owners, they are tenants. They have no legal standing in this matter. Once you have heard from Aztec Properties Ltd, please let us know. Goodbye officers," she said as she turned and walked away.

"Shit, send an alert out to the execs summarizing the situation. Include the lip reading, and make sure they know I'm on site and so far it looks noisy but peaceful." Vern said as he paced the front of the building, peering down the sides to make sure none of the Doomers were sneaking around.

"Underway ... sent," Proxy replied.

"Stash, a message just came in from Vern, there's trouble at the office," Zero said, breaking the uncomfortable silence which had settled on the room.

What now? "OK, play it on the window," Stash said, too out-of-sorts to get up and grab his glasses.

They watched the clip play.

As Professor Smythe was having her conversation with the cops, Francis commented, "I'm seeing a lot of her tonight. I wonder if she brought her mystery friend?"

"Oh shit, her friend! Zero, load the scanner!" Stash barked as the penny dropped.

"On it. Interfaced to the building AI, it is loading the scanner for that Berlin encryption protocol on all the hotspots at HQ," Zero replied.

"Patch me into Vern too," Stash said, walking over to his glasses.

"Yeah, I'm kinda busy here," Vern said, as he answered Stash's call.

"The Doomers were meeting with some sketchy dude using a novel encryption two nights ago when I got my face punched in, Zero had the building load the scanner for that signature. Watch for it," Stash said.

"Yeah sure," he said. *Nerd! I got a mob here and you want me to do protocol analysis?*

Vern looked over the front again. The crowd was stable. Smythe was using the cop cars as a backdrop along with the flaming forty-five-gallon drums for the speech she was making to a camera. Proxy couldn't pick it up. She was facing away. He didn't care, it would be the same old Doomer bullshit about the impending rise of the machines. He hated them, and not just because it was his job.

He paced back and forth. The anti-climax was wearing on him.

"We have hits on that protocol scanner," Proxy told him.

"Great, tell the uber-geek," he said, not interrupting his pacing.

"Vern, the hit is from inside," Proxy said, posting a schematic of the building and indicating the wifi hotspot near the back door.

"What? Oh shit, oh shit," Vern was already in the stairwell. "Guide me ... shortest path ... through the lab."

"One hundred yards." Proxy displayed.

"Patch these glasses to Stash."

"Fifty yards," Proxy guided him. "Left when you leave the lab. The hotspot serves that corner."

Vern threw his weight against the handles and burst through the double fire doors. Glancing right before turning left, he didn't even see the elbow that stopped him cold and sent his glasses flying. He did feel the boot land on the side of his knee and heard the sickening squishy-crack of bone and cartilage giving way. He would wake up with no memory of the third blow, the one to the back of his head.

"Holy shit," Stash said to himself. "Vern just got ..." then he realized his glasses were still mirrored to the wall display. Francis and Bot were both watching.

Vern's glasses had been sent flying, but one of the cameras was still recording a glitchy upside-down video. "Fix it, Zero, and call the cops and an ambulance," Stash said, resigned to watching helplessly as this crime was completed. *The cops will never make it back in time*.

The masked figure disappeared into the lab and came out with four removable drives, walked out of view and returned empty-handed to the lab. Again and again.

"Those are one-hundred petabyte drives," Stash muttered to himself.

"What are they for?" Francis asked.

"You only need one to hold an entire model and its history. He's at sixteen, plus whatever he did before Vern ... " Stash didn't finish the sentence.

"What's he taking then?" Francis asked more urgently.

"Everything," Stash answered, staring at the window.

Zero patched the building cameras into the display, and they saw the figure roll a large conference suitcase out the back door and up to a waiting black van. He opened the side panel and lifted the case in easily. *That's at least a hundred and fifty pounds*, he thought. *Poor Vern.*

The van pulled away. No plates, nothing identifiable. Probably stolen. The cops would find it abandoned or torched in the morning, if they bothered to look. He felt his stomach sinking towards the floor.

"Zero, message Dan. We're going in to assess the damage," Stash said, his voice barely above a whisper.

"I'm so sorry, Stash," Francis said. "This moment was never going to come easily."

12. Investigation

Stash spun around at the sound of Dan Jackson, CEO of Freedom.ai arriving in the Roost. Dan, the boy wonder gone to seed, the charmer of venture capitalists and D.C. lawmakers alike. Dan his boss, his college roomy. And today, his inquisitor.

"How's Vern?" Stash asked, taking a few steps toward Dan.

"He'll be ok. Concussion, his face is a mess, worse than yours," Dan answered. "But the knee, that's going to need a lot of work. They can't even operate until the swelling goes down," Dan said, his gaze drifting from Stash up to the wall of displays lining the Roost. "How the hell did they do it?" he asked.

Stash pointed at a section of the wall display over Dan's shoulder. "We've reconstructed it. Tonight was just the extraction," he started. "Somehow, likely with a big 'donation', they convinced the Doomers to stage a protest out front tonight. It was a diversion." The movie showed the Doomers out front on one screen, and the back hallway on the other.

A digital clock appeared over the split display reading seven p.m. "As the first Doomers arrived in the front, the cleaning crew was entering in the back. This is normal for them, a crew of four from Allied Office Management," Stash narrated.

Dan's eyes widened at the sight of the fourth crew member entering. "That guy is huge."

"Yeah, 'Ernst Mueller', allegedly from Austria by way of Ohio, but that's all bogus. He signed on with Allied a few weeks ago. He has a starring role in what's to come," Stash continued, as the clip showed the crew dispersing into the building. "Note he isn't wearing glasses." The clock advanced to five minutes past seven, "The building AI alerted Vern. Four minutes later he gets the message and calls the cops. If we advance a little, here he is coming in the back door at twenty-five after. He runs right past the lab to get to the front."

"Vern must have interrupted something. You can see this black van approaching on the exterior camera, then driving away," Zero added. Then he lit another screen showing Vern's glass-cam feed. "Vern is pacing around, keeping an eye on what they want him to see. Skip ahead a few minutes and it gets interesting."

Stash pointed down the lineup of displays, "Ernst puts his glasses on, looks up and down the hallway, then we assume he makes a call because the scanner gets hits in the lab, and out front."

"He's got a guy out front?" Dan asked.

"Exactly. We don't have the capture, but Ernst nods," Stash pointed back at the second screen, "Then he goes to the back door and opens it up. Presto the van pulls up, he blocks the door, grabs the empty case, and comes back inside to start loading."

"Bastards," Dan muttered.

"Jumping ahead again," Zero picked up the story. "Vern finds out the protocol hit is from inside and starts running down. By the time he arrives, the case must be two-thirds full. Here is when he walks into Ernst's fist."

"Ouch ... oh god, the knee," Dan watched Vern's dismantling.

"Then he finishes up and rolls the case to the van," Zero concluded.

"But where did the drives come from?" Dan asked, getting back to the data.

"Good question. Let's go downstairs to the scene of the crime. Bring your glasses," Stash said.

Freedom's office was a large 'L' shape. The humans worked in the short leg of the L, and the datacenter filled the long part. Stash's Roost was the converted datacenter viewing room at the elbow of the 'L'. Beneath it was the lab used for small-scale test setups, and, more and more, as a store room for old test equipment, dead computers, and other dusty victims of Moore's Law. It was also the scene of the crime.

As they stepped into the lab, Stash said, "Link your glasses to mine and Zero will walk us through it. I built a time machine to take us back through it."

"I'm making your glasses ninety percent opaque," Zero began. "So you can follow while I walk you through time, but don't move around or you'll hit things in the real world," Zero said, as the lab melted away around them, showing the hallway where Vern lay crumpled. "This is what I can reconstruct from the building's camera feeds. That shimmering bubble you are in the middle of is where we have no coverage. It is a hole in space. Now we're going back in time." The hallway turned sepia and a calendar appeared in the display. It read July 25.

"FOUR months!? This has been going on that long?" Dan said.

Stash was glad he could only make out Dan's outline.

"I tracked every time someone entered or left the hole in camera coverage that you are standing in," Zero resumed. "Specifically, whoever entered with more stuff than they left with."

Stash watched a young engineer enter and exit the lab repeatedly, sped up like an old movie. Every day, usually late afternoon, always with a backpack that looked fuller on the way in than the way out.

"Who is that guy?" Dan asked.

"An intern, he works, well worked, on the data science team. Specifically, the data curation group," Stash answered, knowing what was coming.

"Didn't we pick up that he was doing massive copies onto removable drives? Please tell me we check for that," Dan asked, flashing anger.

"We do, but if you'll follow me, I can explain the rest," Zero said, clearing their glasses, and superimposing green arrows on the floor, marking a path to the dustiest corner of the lab.

As they walked back through the floor-to-ceiling metal shelves, Stash spotted a ceiling tile pulled back, revealing a nest of wires in the space between the false ceiling and the floor of his Roost.

"Stash, they literally stole this data from under your nose," Dan said as they arrived, finding a tone more accusatory than sympathetic.

"I'm aware," Stash answered. *And I wasn't in charge of building security, Dan.*

"He used this," Zero said, displaying a yellow highlight around a six-inch square metal box in the plenum with a nest of optical fibers running in and out.

"What the hell is that?" Dan asked walking towards it and crashing into a desk in the real lab. "Shit!"

"Best stay put till I'm done, Dan. It's a fiber tap. You run fibers over it, shave the plastic coating off, bend it at just the right angle, and about ten percent of the light leaks out. The magic of refraction," Zero explained.

"Leaks into what?"

"Into a photo-receptor that duplicates the data running along the fiber," Zero answered, highlighting a second box in the plenum. "And from there into a custom-rigged drive controller that filters the packets and copies the data onto the removable drives we saw Ernst loading."

"No encryption?" Dan asked, almost plaintively.

"Not for internal traffic," Zero answered.

Stash continued, being sure to hide his admiration at the clever simplicity of it all. "The drives are huge, a hundred terabytes, and they take a day to fill up. He just managed his regular work to eventually have all of the data pass along those fibers. Swapping drives every evening, and storing them up there somewhere."

"All the data? What are you talking about?" Dan asked.

Stash put his hand on Dan's shoulder. "All. Everything. They stole our entire training data lake. Seven and a half petabytes"

"Oh no ..."

"And the Cookbook. How we train using it. The whole enchilada, seventy-six drives' worth," Stash said, taking off his glasses to massage his temples.

"Those bloody Doomers," Dan said, his face turning red.

"This was no Doomer," Stash said. "Doomers might torch the place, but they wouldn't meticulously steal our training data. This is someone looking to train an AGI."

Dan's face drained of color. "What a colossal breach of security, Stash."

"Just so we are clear. I don't run building security, Dan. Vern does, reporting to you," Stash was tired of the low-key blame-storming. He gripped the shelving to steady himself, welcoming the pain of the metal digging into his skin.

"You do now. He's drugged up to his gills on painkillers. That means you have to go to Washington," Dan replied, squaring up to him.

"What are you talking about? Why Washington? Why me?" Stash asked.

"You have to go report this disaster."

"'Have to' Dan? What are you talking about?"

Dan dropped his aggressive posture, took off his glasses, and indicated for Stash to do the same. "The NSA is all over us, Stash. They want our AGI locked up and under their control. I'm making one concession after another to buy us some runway, including in-

person readouts for any security incidents. We may not even get to AGI before they shut us down."

"Why me? You're the CEO."

"Because Greta wants to meet you," Dan answered.

Stash tightened his grip on the shelf and slowly put his glasses back on with this free hand.

"What did I miss? Did you tell him about Berlin?" Zero asked him privately.

Stash shook his head slightly. *Berlin.* He should have told Dan about that attack too, but he was running low on trust.

"You can catch the eleven a.m. flight if you hustle. Greta will be waiting for you. I'll get the reconstruction to her," Dan said, nodding his head towards the door.

Greta Knox, head of the NSA AI Directorate. Stash had heard a lot about her. All of it awful.

13. Greta

Stash approached the front door of the NSA offices in Sterling, Virginia with trepidation. All of the sketchy signals intelligence agencies seemed to live in the endless string of unmarked datacenters surrounding Washington's Dulles airport. They were easy to spot: two-story windowless buildings the size of a football field with dual three hundred kiloVolt power lines feeding them. This building, a ten-story black cube wedged into the ground on one of its corners stood out like the Death Star. "Of course she works here," he said to Zero.

"Maybe she's nice, don't pre-judge," Zero advised.

"I'm going to miss your brilliant advice, pal," Stash answered and slipped his glasses into a sealed Faraday bag. The trolls at the front desk would surely make him leave his glasses, and he didn't want them able to poke around. He held the bag up to his eye and told the lock to seal with a simultaneous retinal scan, and voice print of him saying "We the people."

Amused at himself, he crossed the driveway and stepped under the black cantilevered mass of the building. Inside, an airport-style scanner and chemical sniffer awaited. Putting himself back together afterward, he turned to the front desk. A large Marine and his machine gun stood in his way.

"Who are you meeting?" he asked.

"It's ok, Corporal, Greta is expecting him," said a much less impressive man from behind.

The Corporal's face twitched into a half smile and he spun sharply aside. "We'll keep your electronics in a locker," he said, taking the tray of gadgets from Stash.

Stash was hustled into a hallway by Greta's errand boy. He was a foot shorter than Stash, had limp blond hair, and bore the air of being oppressed. No introduction was offered. Stash was led past the elevator bank through a maze of progressively narrower hallways. His guide stopped at a small solitary elevator. "What was wrong with the other ones?" he asked.

"We're going down," said the aide, stepping into the small box. "Ten down," he said to the voice activation controller.

The elevator lurched to a stop and they stepped out. Stash recognized the sensation immediately. The smell of ionized air and a low-frequency vibration underfoot. This datacenter was underground. The aide gestured at a door and Stash found himself face to face with Greta.

She was tiny, at least fifteen inches shorter than him, with long salt and pepper hair pulled back in a bun. Her black frock hung to her feet. "The one and only Stash Kubiak," she said. "I'm Greta Knox."

Her hand was cold and unpleasant to touch.

"Sit," she said gesturing at a chair.

"I'm sorry?" he asked.

"Please make yourself comfortable," she said noting his tone. "What the hell happened out there, Stash? Shouldn't you be guarding the recipe for AGI more carefully?"

"Dan sent you our reconstruction. They were foreign assets, Greta. Isn't that your job, or do you only spy on Americans now?" He was missing Zero, who helped him keep his cool in stressful moments.

She sat behind her oversized desk and considered him. "Very well, if you aren't here to take responsibility, what are you here for?"

"To offer whatever penance your deal with Dan requires," Stash said, unwilling to hide his dislike of the situation. He sat in the chair, hoping to gather himself. "So maybe I should ask you. Why am I here?"

She snorted a little laugh. "I need to find out if you are as stupid as it seems."

Stash said nothing. He was getting used to taking punches.

She looked at him in silence for a long moment. Finally letting out a sigh and asking, "Did you think you could build something this powerful and the world would just leave you alone?"

"The world is Dan's job," Stash answered.

"Dan's not right for this," she said dismissing the thought with a wave of her bony hand. "I'm not sure you are either. But," she added, sitting up and interlacing her fingers, "we'll find out soon enough, won't we?"

Stash stared back at her impassively. *I already know.*

"We are not your enemy Stash. They are," she said, gesturing at the faces displayed on the smart-glass. Ernst and Antonio are new faces for us. We've traced the Austrian. He's a freelancer, former special operations, you know the type. Now working for whoever can afford him. His current employer is unknown," she paused. "Antonio is a data scientist from Bolzano in Northern Italy. He graduated from the Zero Plank Institute in Berlin and went to work for you. There is nothing in his background that would have flagged him. Just a typical European kid, full of bullshit politics."

He nodded, indicating he understood the update, and trying not to betray anything more. She was not wearing glasses, but the wall behind her was likely loaded with sensors too sophisticated to fit in the rims of a pair of glasses.

"What about the cipher?" he asked.

"Ah yes, I enjoyed watching your encounter with the Doomers. The novel encryption you found is novel only in its application. It was developed by Stasi, the East German Secret Police just before the Wall came down," she said, tapping her desk absent-mindedly.

East Berlin is where Zero got zapped. "And now used for glasses? Whose?" he asked.

"Ah, now he's interested," she said before standing and walking to her smart-glass wall. "There is a hacker group called 'The Elysians', have you heard of them?" she asked without turning to look.

"No."

"Not surprising, but you should have. They are the group guiding the open-source efforts to duplicate your work. That is to say that a small cabal within that Open Source AI movement is doing the heavy lifting, supplying the data and compute resources to the rest of those feel-good assholes," she gestured at a large display of all the active submitters to the project. Player cards hovered over most of the lower ones, with real names and intrusive biographical information. Know any of these guys?" she asked, turning this time.

He stood and walked along the wall display. "A few, yes," he said, tapping the cards as he passed them. "They are very public with their support for open source," he lingered in the middle of the wall, looking up towards the top of the hierarchy. The player cards were mostly blank, only a few had code names on them. "Whiskey", "Fish", "Boron" and one just marked with dollar signs. "You don't seem to have cracked the inner circle," he said.

"Yet they seem to have cracked you. Don't be smug, Stash. I could have you shut down at any minute. The United States Government is not interested in having its interests undermined by AI. If it's yours or Coda's maybe we can work something out. If it's Open Source, there will be chaos."

"Chaos, as in you can't control it?" he asked, turning to his chair.

"Don't tell me you are sympathetic to the assholes who just stole your data," she said, rounding on him. "I may have to reassess your utility."

"I'm not sympathetic to thieves, or to 'working something out' with the NSA. My AI is not going to be running in the secret datacenter in your basement," he said as he sat back in his chair.

"Noted. Well that's a discussion for another day, isn't it?" she said, smiling unconvincingly. "In the short term, our interests are aligned concerning the theft, yes?"

"Yes."

"Do you have anything else to share?" she asked.

"No," he answered, glad he hadn't told Dan about the attack on Zero.

"I have a man in Berlin, you should meet," she paused and eyed him severely. "I expect your full cooperation while you are there. Any freelancing will be very detrimental to Freedom's ongoing training, Stash. In any event, it would be unwise. People like Ernst won't just break your nose if you stick it in their business, they are killers. Vern was a lucky man."

Stash wondered if Vern felt lucky at the moment.

"My aide will give you the details as he sees you out," she said, sitting down and disappearing behind her monitor.

Too relieved to object to the rudeness of her dismissal, he walked out, falling in behind her lackey.

Back on the surface, he retrieved his kit and slipped Zero back on as soon as he cleared the menacing overhang of her Death Star.

"You ok, Stash? You seem rattled," Zero asked.

"I need a drink. I'll fill you in at the airport. And then we have a flight to catch," he answered, feeling the sense of dread recede.