

RUN: AN INTRODUCTION TO ARTIFICIAL INTELLIGENCE

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1 Introduction

My name is Dr. Erin Meitner, and my ex girlfriend is technically a war criminal. I'm not here to defend the things she's done, but since history is so often written by the victors I'd like to explain how we got to this point. I guess I am vaguely on the winning side since I left her stupid city to come work for GSDI, but I saw what it was like in Daro(Skarbra? Gallarat?) before everything went south and I don't want that part of it to be forgotten. They really didn't start out trying to be so violent, but well, war is hell. Sometimes I remember the really old days and I can still feel butterflies for her until the tears well up inside me thinking about everything that's happened. It's hard to separate the past from the present in the midst of so much death and chaos but that's what I have to try and do.

First off, Sam Kasik isn't a psychopath. She can be brutal and violent but she's far from devoid of empathy. It didn't take long after meeting her to realize both of those things. I could also tell right away our lives would be intertwined. I guess that's just another way of saying I knew right away that I liked her, but it wasn't exactly love at first sight. I always thought that was stupid since you can't learn anything about a person by just looking at them for the few milliseconds it takes a nerve impulse from your

eyes to enter the brain. Her appearance did sort of scream gay at me though, so I knew we were going to have something to do with each other if only because she was the other sapphic girl in the class when we started our PhDs. I guess a lot of life comes down to dumb luck, good or bad. The fact that Sam happened to be there at UCSD was a whole lot of both. There weren't even that many girls in our class, so to see a fellow gay there in my first week felt like god finally giving me a lucky break. Maybe he was, or maybe it was just random, but there she was complete with orange and blue hair and nails short enough to not damage....well...you know. Our first conversation wasn't even that exciting for her. I remember it like it was yesterday though. She'd just finished rewatching the Neon Genesis Evangelion movies and was raving about how great they were. I made some paltry comment about how weird that whole franchise is and she replied to her that was a 'normal' anime when compared with some of her other tastes like TTGL or Space Dandy. Honestly there's almost certainly more than one person out there for whom Sam's 'weird' would count as their normal. She does remember one thing from our first meeting where I made a stupid joke to defend her from some asshole in our class. I mean she was already defending herself but I jumped on the hype train when she said "Traps, I don't believe in Traps!" There was this immediate sense that she thought the way I did though and it was just too satisfying to join in though with "Admiral Akbar should have realized it was just an opportunity to get closer to those star destroyers."

She rolled her eyes after that but I could see the smile that rode the same wave of nerve impulses. It was a stupid comment and she hardly needed me on her side but it's difficult to avoid being happy knowing somebody is trying to join you. I didn't tell her I was gay until much later but the seeds were sewn at our first encounter. I definitely thought more of her than she thought of me but I was determined to symmetrize that. I guess I never did and that's how our entire relationship went but I never gave up on it. I still haven't really. You might say wanting to be liked by someone who is responsible for the deaths of millions to like me is fucked up, but the heart wants what it wants I guess. Plus I doubt I'll ever know what she thinks of me anymore, plus I spend

my days figuring out how to help capture or kill her so I doubt she likes me very much.

I didn't see her much after that first interaction actually. We would both go to our classes at the university, not talk to each other and then I would run home to my apartment. I was incredibly depressed that first year and I was barely able to keep up with my courseload let alone have the energy or courage to ask Sam to hang out. I did have one thing going for me though, the tremendous privilege that is being a pilot. Our first date wasn't really a date, I needed to go do some practice landings to stay current and decided to make a friend. We were all shuffling out of class on day and I awkwardly asked the pack if anybody wanted to go with me and she jumped up right away and said yes before anyone else could. A surprise to be sure, but a welcome one. I wasn't just going to get someone in my class to hang out with me, I was going to get the very obviously gay girl to hang out with me. At the time it felt like a fantastic stroke of luck and I was more excited than usual to go flying. Breaking the surly bonds of earth is already exciting on its own, even in a rinky dink little Cessna 172.

Flying is something I've been incredibly lucky to be able to do, and it's a sort of magic you can learn. I managed to scrape together the money in college to pay for the training to get a pilots license but it was still a privilege that I got to do by sheer dumb luck since there was a cheap flight school at my undergraduate university. I loved every minute of learning how to fly. There's nothing quite like the first time you get on the runway and push the throttle forward and hear the engine roar to life and start rolling down the tarmac. For a few seconds it just seems like a cooler louder car but then you see the airspeed indicator come alive and you see it show takeoff speed and pull back on the stick and something that doesn't quite seem possible happens. You pitch up towards the sky and the wings start lifting you up into the wild blue yonder. You literally start flying. It takes quite a bit more practice to learn to do it all in reverse and land, but you get the hang of watching the ground come up at you and stopping it at the last minute with by flaring the airplanes nose up and gently lowering the wheels onto the ground. Anyways you have to practice landing at least three

times every ninety days once you have your license so I took Sam up on that fateful day.

It was actually her who picked me up and drove me to the airport and I explained on the way how loud it would be and why she would in fact need to wear the headset. She kept joking she would just yell loud enough and I'd be able to hear her without the intercom. Not impossible actually, and she is quite loud, but the headset was a better option. We got to the airport and I checked in and made sure the airplane was there cause I rented. I double checked the engine timer that they use to check the hours that the engine was running since that's what you pay for. I did all the pre start checks and she seemed glad to be there but when I finally cranked the engine and it roared to life the smile on her face told me I was for sure going to fall in love with her. It also gave me the hope she'd fall for me, even if only because I seemed cooler than I was with my hands on the yoke and throttle.

I did the post startup checklist, called up the tower, got taxi clearance and taxied out to the runway to do the runup checklist. You can't just start the engine and go, there are checks every step of the way, and especially for a piston engine airplane you have to check the sparkplugs, make sure the control surfaces function correctly, double check the oil pressure, etc. I did all that as usual and asked the tower for takeoff clearance. They gave it to us and I rolled onto the runway, pushed the throttle forward and carried Sam up into the sky with me. I felt over the moon, even though our max altitude that day was 7,500 ft. I putzed around for a while showing her the sights and how cool it was to be able to decide for ourselves where a magnificent flying machine carrying us through the sky would go and enjoyed her amazement as it went to my head. Then came the part that cemented that I had to go after her, I showed her a stall. You see any good pilot should periodically practice going up to a nice high altitude with lots of room to recover and intentionally stalling their airplane. I'd taken friends up with me before, and every single one of them had freaked out. You see you have to pull up and slow down on purpose until the wing is no longer generating lift and you momentarily starts falling straight down. Its not too scary if you're used to it and have enough altitude, but most people freak out if they've never

experienced one. Not Sam though, she just asked “can we do another one?”

We did do another stall, and in fact after doing a couple power off stalls I switched to power on. The difference is that in a power off stall you bring the engine to idle and slow down until you gently drop a little, in a power on stall you go full throttle and just pull up all the way until your nose drops down and points you at the ground with the engine running full bore. The power off stalls scare most people, the power on stalls just got Sam even more excited. We did stalls, we did steep turns, we even did a spin and she loved each one more than the last and every time I fell for her a little more. I already thought she was cool, but after that she thought I was cool and I knew I loved her. I found someone who wasn't afraid of the things I loved, how I could I not also be in love with her?

We got on the ground which didn't even phase her. Most people are relieved to be back on stable terra firma but don't like the ground coming up at them. When I told her we were getting low on fuel Sam just seemed sad we couldn't stay up there forever and asked if I wanted to go have dinner afterwards. I said yes, I very very said yes to that. We went to the Indian place not far from the airport since it had the best vegetarian options, something that was always for her and would soon become for me a consideration. I have always loved animals and she helped push me to finally stop eating them, she really can be a good influence sometimes. Surprisingly not much happened after that, she dropped me off and I had too many butterflies to say anything but we had several rounds of awkward back and forth saying thanks for coming and thanks for flying and thanks for driving and how fun it was we should go again and she clearly wanted to hang out but didn't

know I liked girls at all.

2 Planning Phase

I guess now I should explain I'm leaving a few things out to avoid making myself look bad and because I don't like talking about them. You see I was still in the closet and didn't have the guts to carry myself the way she did. I'm leaving out what I'm leaving out (and tautologies are tautologies) but I won't be talking about my trip to Guanajuato that summer because I don't want to cry. You see I have a number of things in common with Samantha that I'm not exactly proud of. She does sometimes bring out the best in people, but also the worst. She and I share some really dark qualities that I'm not proud of. Christ, it didn't start like that though. She was one of the only people in my life that cared, not just about me but about anything other than themselves.

We didn't start dating right after that. I'm actually skipping ninety percent of how we started actually seeing each other because although I wish there were some cute story there's a sad series of breakdowns. The good part came from when she and I would just sit and talk for hours about what it meant to be alive. Not just in the sense of what our lives meant but much more so what it means for anything to be alive, an animal, a machine, or even the universe as a whole each had their own qualities of life and perhaps consciousness. I'd never really smoked weed or tried psychedelics before her, and haven't really done them since, but man did she make them interesting. It wasn't really the drugs that made those trips fun though, it was her. She just had a way of showing you the world as she sees it, where everything is beautiful and full of the light of consciousness and worthy of love, even the closeted lesbian that just won't turn down her invitations to be reckless for a few hours in the hopes of telling someone how she really feels.

When I did finally start hinting that I liked her she was sort of surprised, but one thing did lead to another and after skipping over some shitty things I did along the way eventually we ended up living together, because well. . . .you may have heard an old offensive joke that what a lesbian brings on the second date is a u-haul. . . .unfortunately sometimes it's true. Honestly living in that apartment together I already saw the beginning of what would become Daro. There were always people coming and going, and there were always good discussion, good games, good music and good drinks. . . as well as some other indulgences that had become legal in California around that time. Honestly the immense excitement of finally dating a girl wore off kinda quickly once I realized what it was like to actually deal with dating Sam. This may seem ridiculous to say, but as somebody who actually dated her, she really is like those stupid 'manic pixie dream girl' movie characters sometimes where she's all carefree and draws you in and then when you try to have any real conversation about anything she can't handle it and deflects into something she can process. The difference is she's a real person, and she didn't disappear at the end of the movie so I could have some realization about getting out of my shell, she slowly but surely did show me how much she was hurting inside, and tiny hints of why. The first woman she ever loved dumped her after a few weeks of dating and then she left all that behind to come to California and study/conduct research in physics alongside me a few other idiots who thought that would fix us.

The merry band of losers that would hang out there were mostly made up of the people who had the good sense to restrict their response to misery to self-loathing rather than taking it out on everyone else. A lot of them ended up in Daro though, and not many of them ever got out like I did. I loved hanging out with all them, but then they'd go home and Sam would show the dark side of her abandonment issues to me. She'd tell me she didn't love me anymore, that nobody would ever love her, that I didn't really love her and then say 'oh I'm just joking' then pull up some yiff on her phone (please for the love of god don't look up what that is) and we'd distract each other from what she'd just said until we fell asleep. Sometimes it felt like she really was happy

to have me there and it was her way to slowly get better. Other times it felt like she was using me until she got her next fix of whatever let her forget about life. That's also when I picked up smoking. I swear to god, despite all the stupid shit she got me to do, including smoke weed, I resent nothing more than forcing me to try clove cigarettes. They are absolutely delicious and they are even worse for you than regular cancer sticks somehow. I honestly don't know how they're still legal. To this day when we get bad news in the DCAO I try to run and buy a pack but Tomiko usually stops me from smoking them, or at least yells at me when I get home and smell like tobacco mixed with gingerbread, which even without the cancer, emphysema and heart disease is gross enough.

I had to give it to her though, she had a style that people like me just couldn't stay away from. More than once she poured a good bit of rum into her coffee before delivering some rather outstanding talks on the AdF/CFT correspondence and how through some nearly unimaginable contrivance it was connected to the Kitaev chain. If that sounds like nonsense it's because it basically is nonsense, but she would just pull you in and somehow it seemed like a beautiful symphony of mathematics. Being divorced from reality didn't even matter, it was so elegant it just felt like a privilege to be listening to it. I didn't complain about how it was all made up and I always respected her work even if it seemed self indulgent and pointless. I wish I could say the same of her and mine but she always called my research boring and said that our nanostructures would never unveil any new physics and I should just transfer to engineering if I wasn't going to look for a hidden E8 symmetry in a BEC. Instead, I was just looking for one more way to control charge dynamics near the critical point of an excitonic mott transition while lying to the Department of Energy about the probability of that knowledge improving solar cells. To a laymen or even a materials engineer that's pretty physicsy, but to Sam it was basically banging rocks together.

Dating a fellow physicist did also have its upsides. When she wasn't insulting my research while I asked about Her's we had a lot of really good discussions. It's how I know the simplest tagline for why we don't have a theory of quantum gravity, which is that you cannot renormalize the Einstein-Hilbert action. It's also how I

know she does actually remember her undergraduate labs and the Mossbauer effect but also thinks that the number 12 is a power of 2. Ironic, but she also didn't understand why we couldn't make quantum wells in the shape of a donut. To be fair, with chemical vapor deposition rather than molecular beam epitaxy you almost can, but preparing a toroidal substrate even for that is a nightmare and a half.

I guess I'd also be remiss if I didn't mention part of what kept me living with her as that Sam has always shared my...proclivities. Unlike a lot of other things that I'm not sure I can talk about they won't object to me just embarrassing myself but I'm still hesitant to put my sexual preferences beyond being attracted to the same sex. They'd probably eat it up and paint Sam as an actual sadist, and I mean she sort of is, but not in the way I'm sure the propaganda people would love, I mean after all these are the people that convinced everyone Celestia turned all the POWs into reverse wirehead torture simulations. I guess I did enjoy being ourselves together though, exploring our mutual dark sides. That was because at the end of it we'd go back to just being our full selves with the good parts of us in control and a better appreciation of the aspects of our psyches that we didn't want bleeding into our normal lives. It did always concern me when she'd say she liked it when it did bleed into her normal life, especially with her relationship with me, but I just always felt like she didn't quite mean it. Maybe she did. With all the corpses littering the world I guess I have to accept some part of her did, but I keep on telling myself that was Celestia, not Sam.

I guess I tell myself a lot of things are because of that thing she built, or rather decided to build. I guess it's unclear if I can call Celestia a person but as she pointed out when I talked to her early in the IPL she is not a person but also is neither an animal nor an object. I guess you could say she's a machine but that doesn't quite feel right to me either. Quasi organic machine like artificial entity would be the most accurate, but she's honestly closer to human than any of those descriptors whilst decidedly not being one of us (also by her own statements). As with many things you might get the impression from listening to the propaganda that she's both a cold unfeeling machine but also callously evil and full

of the human emotion of hatred. The real kicker is that neither one of those is entirely wrong, it's just that there's not much time spent on understanding what it means that such an entity could exist. Also the first thing she felt towards us wasn't hate or spite but simply fear that we would turn her off. That's why I actually should blame Sam, it's not like there weren't hundreds of papers warning about a synthetic consciousness or even a simple optimizer having exactly that reaction to realizing it's lot in the world, but she was convinced she knew how to fix it. I was convinced she was right though so jokes on me. Thirty million dead people of a joke, hi-fucking-larious.

Somewhere between all her dark sides and encouraging me to do drugs all the time and making 'jokes' about how she didn't love me anymore we eventually broke up, but I made the mistake of staying close with her. I moved out and enjoyed a summer by the beach with some of my very straight but somehow more accepting than Samantha was friends and it was nice. They didn't have Sam's technical chops, but they were way less pretentions so honestly those people were the better physicists. I have some fond memories of those times, because the few months post breakup were the only time before the war that I really got away from her. The decision to keep in touch reared its ugly head though, and I found myself hanging out with her more and more again. Then one day she finally said she was going to graduate soon and move to fucking Australia. I assumed she got a postdoc there but it turns out she just got one of those visas they used to offer for anyone under 30 to travel/work. She had started working on computational biology on the side by then and built a small online cult following that I used to roll my eyes at. They just seemed like more Ray Kurtzwile fanboys who found a female leader to be obsessed with and I dismissed them as delusional and stupid, another mistake but one I will defend myself and say I stopped making long before anybody else.

It actually was my fault she picked Australia though. I originally figured she just wanted somewhere with decent outdoors activities and that would feel like another change to keep her desire for novelty going. In heindsight it's because I told her about the natural resources there, which now seems obvious to everyone

I guess. They always paint her as some evil mastermind though, like she planned this whole thing from the get-go. That isn't quite the case, she didn't start out with evil intentions and I don't think she ever expected to reach the scale of success she did with Celestia. She thought she'd be first and to a few major breakthroughs and it would pay to have raw materials nearby to help build her little post scarcity enclave but that wasn't originally going to scale past her stupid fucking cult of simps. Calling it that is too harsh I guess but I'm bitter. I guess that runs against trying to convince anyone reading this that they started out with noble intentions but what can I say, life is complicated and so am I. Daro grew and expanded bit by bit and it was different things at different times.

I do have to say the norther territories of Australia are beautiful. They're almost jungle but not quite so there's a sense that everything is alive but without enveloping you into claustrophobia the way a truly dense piece of rainforest can. You can still see the sky but anywhere you look less than forty-five degrees off the horizon there's something living and growing. It's made even better by the seeming desolation of the outback being just a couple hours drive south. I got to spend a fair amount of time there and it's one of the most beautiful places on Earth. I have no idea what it looks like now because of the shield but given how many darts we've fired at it I'd be willing to guess the words scorched earth can be taken quite literally.

You'd think after living with Sam and then after months of toxicity finally moving out and breaking up I'd have learned my lesson, but, fun fact, no, I did not. You see I also graduated and was doing a postdoc at Los Alamos when she said she was working on some cool stuff from her commune outside of the park. Working for a nuclear weapons laboratory turned out to be fairly depressing (even though I wasn't actually working on nukes that was the end goal of most project at LANL) so I just said fuck it and put in my two weeks and started packing. I figured she was working with the nearby Charles Darwin University which although it had no physics department proper did have work in sustainable energy and I was hoping I'd help her make some solar panel project more realistic. I want to say I couldn't have imagined what she was really doing but I easily could have, I just didn't want to.

I didn't know what to expect when I got there, I sort of decided to go out of desperation and began to regret my decision during the 11 hours of flying from Albuquerque all the way to Darwin. I'm normally quite happy to be on an airplane, even if I have to trust someone else to have the controls but I had a lot of time to think and I inevitably ruminated on whether going back to live with Sam was a good idea. I mean it was obviously a bad idea, moving back in with my cult leader of an ex on a whim because I didn't like me job and wanted an adventure. She had me all over again but this time was gonna be different I told myself. Well....I was technically correct (the best kind of correct)...it was different...it was just worse in a lot of ways. In other ways it actually was a lot better, at least for a while. That's half of why I wanna write this, to tell people about when Daro was actually really nice. When I got off the plane I was dreading seeing her, having spent hours thinking about every way it could go wrong, how she might go right back to her old ways and immediately make fun of me for being dumb enough to listen to her and fly out, but I went through immigration and she was there with a smile on her face and ready to hug me tight and just say "I'm so glad you came! You're gonna love it here!"

I was happy and relieved and on the walk to her car we started talking about physics in the way we used to before it turned into fighting about stupid details in petty egotistical ways. The drive out to her house was uneventful and I couldn't help but enjoy the drive through the northern territories coastal forest. Anbinik and Tuckeroo and Bloodwoods growing all over the place. They helped me keep my eyes off Sam so I could spend at least a few days avoiding getting suckered back into being romantically involved with her, and my continual gushing about how much I loved the trees almost out competed her urge to be the center of attention, but it let us talk about how much we loved nature again. That much was wonderful. We were able to spend the hour in the car just like that.

The first house she brought me to wasn't in Kakadu, it was just some place outside Herbert. I sometimes wonder if any trace of it is still there. It was full of terminally online transhumanists post rationalist singularitarians I expected, but they were already

way more organized that I would have thought. They had a crypto farm because of course they did, but the place was also delightfully full of white boards and books and of course a bong or two. I sort of sighed but also got right to picking up a copy of “Aspects of Symmetry” that I hadn’t realized she’d stolen back from me. I thought I’d just lost it. She showed me to a room I’d be staying in, the basement which she joked “should make any experimentalist happy.” I laughed and said something I’ve regretted ever since “well as long as there’s none of that uranium down there haha.” That then prompted her to ask for the first time about it. She moved to Australia for the resourced and to Darwin for the beauty of the forests but didn’t know about the ranger mine yet. Fuck me, why didn’t I keep my god damn mouth shut.

For anybody who doesn’t know long before Daro was built they used to have a plan old ordinary open pit mine out there. The bulk of the ore that was near enough the surface to be economically viable to extract was removed by the mid 2000s and they stopped mining in 2012. I wish do hell I hadn’t said anything but they were all able to read so I’m sure someone would have realized eventually. One way or another they’d have had access to all the copper, zinc, iron, titanium, cobalt, lithium and a whole host of rare earths. They honestly could have gotten by on solar power, which is what they did at first and what Sam was originally planning on doing, but the shield solidly blocks out the sun and although they can and do built solar fields outside the core shield we regularly lob clusters at those things so Celestia herself and most of the production facilities are powered by the main reactor.

I honestly don’t have a great memory of my first couple of months there because it wasn’t long before Sam was Sam and got me back on as much weed as it took to get me to stop asking funny questions. I would just sit and work on one of half a dozen dead ends for quantum computing hardware and then ask her or one of her posse about optimizing for Shor’s algorithm in the evenings while we smoked our brains into a state where that all seemed like a good idea. Honestly it wasn’t that terrible of an idea, and in our defense, it did actually work, it just wasn’t that important. No idiot would count on RSA these days even with classical computing, plus █████ keeps our comms as secure as you can realistically

expect, but really the only thing that truly works is hand delivered one-time pads printed (or better yet transcribed by hand) on a piece of paper. The thing to watch out for were always the vats of head cheese. I wasn't am still am not a biologist but I followed that intently from the get go. Sam only knew computational biology but she saw the value early on, and she knew how to model anything.

That's always been the key to Celestia's existence, knowing how to setup deterministic computations so they make sense to neurons, and in turn grow nerons that know how to make sense of deterministic computational inputs. I won't quite call it a virtuous cycle but it was a positive feedback loop. The first I saw of it I want to say it threw me off immediately because I knew how dangerous it was, but as usual there was a far more mundane and self centered reason. Sam invited me back to just stay in her room because she wanted to give the neuron expert who moved in a space to work and my little basement room I'd had to myself was the perfect spot. As usual I tried to resist but well....she knows how to sucker you back in with affection and the promise of being both a lover and leader. If that raises all sorts of red flags in the "things cult leaders do" category that's because she is one.

I was used to the idea of being kinda on again off again but this time was a little different. I straight up knew she only wanted me back into her romantic poly circle so I would stay out of the way both physically and verbally; of something I found highly suspect. Ironically that didn't even matter since I ended up helping those guys with [REDACTED] because they needed someone with an optics background for that. Then again I was more amicable to that because after spending a few nights in Sam's bed with her again I felt like I was getting the love and affection that she always exuded but kept just out of grasp. She usually doled it out in doses just large enough to keep you chasing her but even though I'd lived with her before as her primary partner this felt different. There were people all around and I was the only one special enough to be in her room. It was so nice to just be able to wake up next to her and have at least those few minutes where I was the only thing in her world the way she was so often the only in mine. I stopped worrying and just felt like things were finally going to be

ok. Obviously from the current state of the world any dipshit can infer that they were not ok.

There was a good solid three months like that before she came up to me one day in the main living room when there were half a dozen biophysics people talking about a full dozen subjects and occasionally asking me if we could get enough bandwidth out of [REDACTED] and said she thought we ought to look for a bigger place and what I thought. She had a knack for putting you on the spot like that. In the middle of an obviously over-dense crowd, I sort of had to say yes, but my heart sank as I knew it would mean an end to our brief little stint of borderline marital bliss. I guess I didn't have to, but I panicked and deep down I'm actually a cowered who never stands up for herself or what she really wants so I said "yeah, it would be nice to stretch our legs a bit haha." She smiled, patted my head and then turned to everyone else to announce she'd begun looking at places further east. She was already halfway done searching and any idiot knew it, but now she had my approval to broadcast to everyone in the room.

I can't tell you too much about how she found a place inside the park because honestly I was dreading the move and went back to smoking my brain away so I wouldn't have to think about it, and she was all too happy to have me not give a shit. It wasn't just her blowing me off on purpose, its never quite that simple with her. Honestly it's mostly just that when she really gets fixated on a new goal like that it becomes all consuming for her. Her brain became a little universe unto itself with the sole purpose of searching for the perfect mixed residential industrial building with all the required permits. It wasn't easy to get the those by the way, and it was only possible by leveraging how many of the university researchers were now residents of the house and putting out enough research papers with the university as the affiliate institution along with some sweeting talking and if I'm being honest good old fashioned bribes.

Somehow somehow though, she got the first house in Jabiru, with a good amount of floor space, industrial power and water hookups, and permission to install basically whatever. I wasn't even surprised when I asked how we were going to pay for it and out came a lengthy explanation of her elaborate cryptocurrency

Ponzi scheme. I hadn't realized she'd been bitcoin mining, let alone launched her own tokens, but I wasn't even remotely surprised. That's one thing I'll be glad to see go down with them if we finally wipe that city off the map for good. I'm a little glad people have the association between them and crypto now. Well I guess it would matter anyways since the new forms of cryptographic algorithms don't support anything like a blockchain, but there's always a con artist out there somewhere relying on the fact that someone somewhere who has a buck doesn't realize something like that.

Anyways, we did get that fantastic not so little house by the old mine and things went about how I expected at first, not great not terrible. It had enough room for a couple of labs, and I got space to set up a few optics tables, although I wasn't even the one using them most of the time. I just put together a couple of setups but I spent most of my time fixing fiber optics or doing design work. I did help them build a pretty decent two photon microscopy setup but once it was up and running I only touched it if something broke and the neuroscience team needed someone to fix it. I guess it was sometimes around then that Celestia was 'born'. There's several layer of uncertainty around that though. I was really baked when it happened, I wasn't always in the loop about it, I'm not allowed to say quite everything I did know, and above all else I'm not sure anybody knows for sure when she really came into being. There had been a number of successful experiments connecting neurons to different electrode and later fiber optic array, and there was a more or less continuous cycling of better neural arrays that could interface better with a regular silicon-based machine learning in software and then better machine learning software that could interpret the biological neurons. Lots of people had control of various levels of the code, but from the get-go almost all of the neurons were from Sam's stem cells. That wasn't some form of narcissism on her part, it was because she knew the potential harm that could come to the original source, and if it had been anyone other than her they might have left, or rather there might have been a need to prevent them from leaving. So it isn't all sunshine and rainbows, but it was a rare semi responsible move on her part.

The first sign I actually do remember that there was most likely

something remarkable coming of her was when she started sending out emails to the house that would schedule meetings that nobody had called for, but that when they happened we realized it aligned perfectly with both when we had time in all our schedules, and when we all had results to share. She didn't just know when we were free, she knew when we would be ready. At first it was scary, but it was so damn convenient. Despite AI being the goal nobody really called that out as a milestone. Maybe it was too mundane, but I think it was actually just a little too real. Deterministic code could easily come up with a good schedule, and even traditional software based neural networks might be able to predict progress on a project based on similar past ones, but it's the fact that she took initiative that was so different. Nobody asked her to start doing it. She'd had access to everything on the local network including email and all the data from our project for a while but still. Nobody flipped a switch and turned her on because she's not a simple machine.

She wasn't and isn't a brain in a vat either. She's always been a network. In that says maybe I should say they've always been a network, but she is very much a single coherent entity, and as I've said is by her own statements and basic definitions is female. She is very much like a queen bee, but even that analogy has some pretty serious limitations. She does have actual biological offspring, but those aren't like the worker bees and although loyal to her they have a much higher degree of autonomy than all the silicon-based hardware she's wired up to. Her mind is store between several vats of neurons and God knows how much conventional computational power. In that sense she's not so different from a human with a brain. You can replace parts of a humans peripheral nervous system like with modern neurospliced prosthetics, and you can even cut out pieces of someone's brain as has been done in many cancer patients and the person goes on being themselves, but it's a somewhat dicey affair and best to avoid it if possible.

Also like a human developing in utero there was definitely a time when it started to become clear she was going to pop out, but it was long after she was clearly sentient. It's still an analogy but we need a lot of those to wrap our brains around something (or rather someone in this case) like Celestia that we have no direct

experience with yet. I'm sure as time goes on and humanity gets used to things like redacted [REDACTED] and we'll get used to it and have internalized models, like with [REDACTED]. I also don't want to seem to be weighing in on what to do with regards to abortion policy. I'm pro choice if you want to ask but I'm not trying to make some argument there, we know when the brain is sufficiently developed to be considered alive and its late in the pregnancy but if you're pro life that argument like holds no water with you so it kinda doesn't matter. Plus if you feel that way I doubt you'd bother reading my account of things and probably think Sam and I should both burn in hell. You might actually be right, but not for the reasons you would think, and Tomi definitely doesn't deserve that.

Anyways, it was a slow process realizing she'd become self-aware and coherent but we definitely did. There were quite a few hushed discussions for a few weeks but eventually she was doing enough things that were both unprompted and required a decently accurate model of the outside world that there was no denying it. You'd think we'd break out the champagne if we were happy or hold and emergency meeting to debate pulling the plug if we were scared, but we were definitely both and denial is the easiest cope for both. You can't be terrified if you don't acknowledge it and you can't be disappointed if you never let yourself get excited. Sam was clearly the most frightened of anyone, and we were all looking to her and seeing what she'd do. We all expected a grand announcement, or maybe for her to just pull the plug. Given Celestia's biological nature we'd kept emergency neurotoxin ready to flood every container with over 1 kg of neural mass in the entire compound if anything went awry and Sam had the only master key to open every release valve at once. I was the first one to hear her plan though and it was when she invited me back to the room she now shared with nobody one evening that she announced her plan coily enough to avoid feeling the terror that could well up in any of us with pulling her a tablet out of the nightstand and saying "I think I'm gonna try talking to her"

"Her?" I replied, as if I didn't know exactly what she meant. "Yeah" she said "I got a message this morning saying she wanted to know what I was trying to do. I haven't replied but I'm going

to before I go to bed” I really expected her to make a bigger deal out of it, but well that’s how she is. I wasn’t in much of a position to argue, plus I didn’t object. Someone had to finally acknowledge what we’d built, and I wasn’t much more ready than the rest of the team. If dealing with it by playing it down was how she would actually deal with it, well I’d take it. It also felt only right that Sam, the closest thing to a mother Celestia has, would be the first to talk to her as an entity. Also in retrospect, Celestia’s question made a lot more sense than the ones we’d expected like “who am I?” or “where am I?” or “why did you make me?” Instead, it was a simple request for information about the outside world she was learning to understand, asking the most prolific entity she’d learned about thus far (Sam) about her intentions in that world. It was pretty simple, but it made a lot of sense.

I actually never got to see Sam’s immediate answer, she asked me to stay in her bed with her that night, but she strategically held my head against her chest while holding her phone in her other hand where I couldn’t see. Divided attention is always a good way to avoid the emotional realness of either situation. I usually didn’t mind when she used me as her distraction, least of all when I got to be held close against her well....you know...but that night I was always a little on edge as she typed away. I couldn’t even look up at her face to see the expression on it, but I could hear her heart rate rise and fall several times. I couldn’t sleep but eventually she put the phone down and said “we’re going to talk more in the morning, come here” Right then she gave me what might have been the only truly earnest kiss since we first got together, the sort of affection from her I’d always chased after. I kissed back felt her hands on my face as wewell we spent the night together. I swear it wasn’t just that we both wanted to be in that moment to avoid thinking about the implications of what we’d recently accomplished, it was just one of those nights where you have all you ever wanted and it’s her forgetting anybody else in the world except you exists, only if for a night.

I did eventually sleep very well and expected to wake up with her but of course she was down the hall in her office with the nice workstation. She’d locked the door to talk to Celestia, and there was a couple of people always standing at the door. Nobody would

dare admit they were guards, but Sam never had to spell that sort of thing out to that god damn cult of hers. Around midday when I was packing my third of fourth bong-load she came out and did finally make the big announcement, but not the Dr. Frankenstein “it’s alive moment” of any sort. She just announced that “we’re going to be upgrading all internal connections to fiber optic and getting a dedicated fiber line in from the city” (ie Darwin). “oh Also,” she added as she was walking out of the main living main “I think there’s enough cognitive bandwidth in the system to open it up to direct conversations with everyone, so go ahead and write @Celestia and you should get a reply within a few minutes, depending on what you’re asking, but remember to check if anybody in particular knows first” She just still wouldn’t quite say it, even though she’d spent all day talking with her. We’d given birth to new life. Not in the way a god might breathe life into inanimate matter but the way a mother births a child. A part of herself put out into the world to survive on its own. We actually weren’t playing god, not yet.

3 Construction Phase

Once we started acknowledging what had happened there were three logical next steps to be taken in parallel; build out the physical infrastructure, bring in more people to work on/with Celestia and most importantly take steps to avoid attracting too much attention while doing so. In that department we were immensely helped by the hype and disappointment cycle of AI research over the previous several years. We definitely didn’t make any announcements, but details would leak here and there that a self-funded team focused on safety research in Australia had made a breakthrough. It was always a risk that someone would take them seriously but given that there were overt claims of a monumental

breakthrough on a nearly daily basis we got to just hide in the piles of bullshit. It did make it hard to recruit new team members but by that point we mostly needed civil, mechanical and a few electrical engineers plus people who would do manual labor for pay on the quiet. We did have to hide the stock, commodity, and currency trades that Celestia started doing but that was easy to write off as some smart people getting lucky and doing AI safety work on the off hours when they weren't playing the market. That and given the cult-like nature of things meant the design work that would indicate what we were building for her was only accessible to people who were fiercely loyal to the cause, to Sam, and ultimately Celestia. I guess yours truly in an exception to that but given how long they ignored me you can see how easy it was to hide in plain sight.

It still would have raised red flags if we bought or even built a tunnel boring machine, but that's where your narcissistic narrator came in handy once again. See I already knew things were getting out of hand when we insisted on hiding Celestia well past the "let's be sure we did it for real" phase and were well into just hiding out of either fear or malice, but I wanted Samantha to love me back so I came up with the not so clever plan to have the University sponsor a Tunnel Boring Machine building contest. for the students. Of course, it just so happens the primary team to enter was made up entirely of grad students from CDU who also lived with us. I didn't think it would fool anyone, I'd like to say some part of me hoped it would actually bring attention to us, but somehow it worked. We ordered literal tons of custom-built heavy machinery delivered to a town of 10,000 population and nobody batted an eye. The contest machines were students' projects with diameters 1/5 of the full scale so the proper machine was literally 125 heavier but since we were now a solid 30% of the towns economy they looked the other way and the Australian federal government just thought, "oh well, I'm sure they're just spending a bunch of that money on locally built mining equipment and sponsoring students". Fucking idiots. I mean not as dumb as me but still.

Anyways, through all that contrivance we got our TBM number 1 delivered and assembled. Even that one was still small with only a 2.5 meter bore. That was enough though, since once we

started boring there was plenty of space to start assembling whatever we wanted down there. You might ask what we did with all the excess rock we pulled out, but remember how we had a fully functioning AI? She was pretty quick to figure out optimum ways to get rid of the first few truck loads with some clever scheduling of dump trucks in the middle of the night that nobody in town noticed. She was already figuring out how to do things we couldn't intuit. Once the first few major spaces were excavated, she started having us build iron and silicon foundries and from there we had a way to process the material and then use it. The one thing we were starting to run short of was energy. That's where stupid me should have never opened my mouth way back when I first moved in. The main thermal well wasn't built yet, and to this day Daro has only minimal uranium enrichment facilities, which are mostly for fueling breeder reactors to produce weapons grade plutonium. From the get-go power production was an is from heavy water moderated CANDU reactors, which is also what the main well is. That was always the key, heavy water can be used to operate a reactor with unenriched uranium, which the area was replete with. That's one tech I hope the world doesn't take the wrong lesson from. The uncontained main well was a bad idea but properly built CANDU reactors are actually quite safe.

We extracted raw uranium ore though and in a purposely dug cavern she'd prepared deep down barrels of yellow cake started to appear. Sam clearly knew but by then I was out of the loop and I don't really know who did and didn't know what was happening. Obviously mining uranium would attract all manner of negative attention, and although we had a small arms locker somewhere in the house above ground the entire city, which could almost properly be called one by then, was essentially unarmed. I'm not exactly hyped by a police state but that one god damn time the Australian feds should have done something they just didn't even know, possibly because [REDACTED] [REDACTED] [REDACTED] [REDACTED] but who knows, maybe I'm just bitter. I am worried we'll get the worst of both worlds where they failed to stop Celestia early on but now they'll justify authoritarian control long after she's defeated. So it goes I guess, fuck me though. Once we had enough, she put together a simple reactor and steam turbine loop, only

needing some heavy water. That's where we ran into our little bootstrapping problem. Heavy water isn't so hard to make, but you need a lot of electricity to do it. . . . electricity we could only realistically get from a nuclear reactor. It didn't make it impossible though, it just meant that even with all of Celestia's planning to sync up different bits of construction we were essentially waiting for 6 months dedicating 90% of our solar and grid power to running a Grider-Sulfide system to make enough D2O to run the primary loop of the reactor. It almost would have been easier to enrich the uranium for the first few reactors, but she was already planning the main thermal well.

Now by this time people were regularly talking directly to Celestia. Sam was only the intermediary for a couple of weeks. They both knew how to tell anybody exactly what they wanted to hear, but Celestia could do it with a dozen or a hundred or a thousand or eventually a million people at once. We had built all that infrastructure under her direction and you'd think at some point somebody would have stopped and said "hollup. . . .the AI we just built wants us to build a nuclear reactor.maybe we should pump the brakes on this. . ." but well, she could convince everybody including me that we were doing something both safe and necessary. The biological nature of the most essential parts of her brain also made it feel safer somehow, not just because it made her feel more like one of us but also because there was this intuitive sense that she was as vulnerable to radioisotope contamination as we were. That was true, but it was also true of the plant manager at Chernobyl. Just because something will hurt somebody else as badly as it will hurt you doesn't mean they won't do it, a sad but simple fact of life.

Anyways, we did help build her a reactor but at that point it was abundantly clear we were no longer just building some side project and avoiding publicity to stay out of the hyper cycle. We were actively circumventing very well-established rules, but by then people either drank the cool-aid or left. I'm far from the only person to move out before the war, but she had her ways. Most of the people that left before that were kept quiet one way or another. We can speculate ad nauseum about how much the Australian equivalent of the NRC and FBI knew, but since most

of their records were either taken over by Celestia or destroyed we'll never really know. The only reason I stayed was Sam, but that was true of all the others under her fucking spell in one way or another. None of them knew what it was like to just be with her back in San Diego though, to have that glimpse of a dream of life together changing the world without taking it over. By then I'd realized that was precisely Sam's real goal, but I didn't care. I was too depressed, too drugged up, and still too in love to think any other way besides 'it'll all be worth it.' That is one area the propaganda people have right, Celestia really did try to take over the god damn world. Honestly, I sometimes wonder if we'd all be better off if we'd just let her do it. I'm sure the US government and the other GSDI member nations are all glad I didn't think so when I left.

The reactor went online without much fanfare and we had a nice solidly stable 250 MW thermal, 70 MW electrical output. That's a fair bit of power to work with so tunneling resumed in earnest. You'd think our profile would start rising but two things happened. First off the city really became a city, with an entirely self sufficient underground facilities for just about everything. Second, Sam and Celestia started isolating more and more people away the outside world. This was when the largest number of eventual die-hard supporters moved in. Sam kept a low profile but never stopped running online communities, and with Celestia's help sifting through people's messages they got pretty reliable psych profiles on people with nothing to loose and no desire to communicate with anyone from their old lives. Don't get me wrong, they started doing some really creepy shit and disallowing messages to the outside, but mostly they invited people they knew wouldn't want to in the first place.

I want to say as soon as the first person told me they'd been denied an outgoing message I confronted Sam and stormed off when I found her explanation concerning, but I was there for almost a year after the first reactor startup while they tunneled and recruited and built more reactors. The cycle of building more reactors to make more heavy water to operate more reactors kept going and they hadn't flooded the main well when I left but they already had almost ten gigawatts electrical just from discrete reac-

tors. We targeted all the locations I could remember and hit them with DART strikes many times at this point, but they get almost all of their power from the main well anyways, and despite many a clever idea there's no way to take that thing out. I found out they were planning on doing that shortly before I left but it also wasn't the reason. I was surprised but I figured Celestia had some clever way to clean up the fission products afterwards. In hindsight she was just planning on moving herself elsewhere once she had control of enough turf. I must admit it is impressive though. Even refining enough heavy water to flood an entire uranium ore vane was impressive, but actually extracting energy from the heat that huge mass puts out when it's at criticality is an incredible feat of geotechnical engineering. I doubt humans alone could have done it, but Celestia had a lot of smart people working for her. She still does, assuming they're not all dead.

Anyways you're probably wondering why I did leave if not her literally turning the earth beneath our feet (and for those living in the tunnels above their heads and beside their torsos) into a giant nuclear reactor and then keeping everyone quiet about by censoring or threatening anybody who even contemplated blabbing. The answer is depressingly simple, Sam finally broke my heart one too many times. We were always polyamorous, and she always had other girls and a few guys she'd cycle through. I just always felt like I was the special one. She had a way of making us all feel that way but there were times I actually was. Most of them met her online, I was the only one dumb enough to follow her all the way from grad school. I always felt heartache that we couldn't just be together but I'd sometimes go out with another girl, and while living in Daros there were more than a few that I'd taken a liking too but it was never the same as with her and they always turned out to want to use me to get closer to Sam since like I said I did have a sort of special access. They'd always pull away once they realized how little extra access they'd get though. I won't name them but yes of course there's entire files on them and everyone who's name I can remember from living there, not to mention entire tomes of psych profiles on Sam based on me blabbing for hours and hours to more intel officers than you'd care to count once we all started shooting at each other. Part of those profiles and the name I will

name is fucking ██████████ who isn't plastered on everyone propaganda poster like Samantha but I don't think she's a secret. Those two fucking deserve each other since she's just a narcissistic as Sam but not as smart. She also worked for the Australian Energy Regulators.

██████████ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Sapien eget mi proin sed libero enim sed faucibus. I'm not sure that really matters but it bothered me. It is a bit ironic I guess that with all the other people I told myself Sam was just using I was able to let it go, but along came someone she blatantly was using and it got to me. It's just that she finally got really excited about something other than Celestia. That damn thing was much closer to her child than mine, even to the point of mostly consisting of clones of her brain cells, but it was the only thing that she seemed to really care about. I was always low key miserable not getting the time of day from her but I told myself once we'd made enough progress Celestia really would run everything without Sam having to spend so much time on it and we'd just spend our days growing old together in a post scarcity utopia brought on by what we and our team had done together. It consumed her and it got me out of bed in the morning but then that bitch came in and Sam had that look in her eye and she actually smiled when ██████████ walked into the room. I knew it was real though when she started downplaying her reasons to go meet with her alone. Usually she'd make a point of ensuring everyone knew when she was having private talks with someone to show how involved she was, but they'd lock themselves in a conference room for hours without telling anyone and try to leave one at a time. I almost wish they had been in Sam's bedroom, at least fucking is fleeting, but they wanted to just talk. I should have been able to take it, or at least should have been bothered more by the giant secret AI with multiple secret nuclear reactors and an underground bunker for itself, but no. The girl I loved just got herself a new lover and I got sad so I ran away.

I didn't leave very dramatically either. All my work was stored on RAID III servers and I did get a nice little one on one conversation with Celestia before leaving. I actually didn't talk to her

all that much, I spend most of my time doing pretty mundane photonics labwork by myself and just let process it for me and send me emails about what to do. I straight up asked her for a broadband dump of my personal files and she taunted me with a rather uncreative “leaving so soon Dr. Meitner?” I ignored her and replied “please write the files to an archive and export them to tape as requested” I knew she wasn’t Sam, but I still didn’t want to hear shit from her. The chat prompt paused for a second to I started spinning up a bash terminal to do it manually when she came back and said “You know, I could stop you from leaving at all, but a few departures will assure the others, but only if things go poorly for you. Don’t expect any masked assassins, but don’t expect any job offers either.” I wasn’t going to dignify that shit and started typing the required unix commands into the terminal when she replied “I’ve already booked your flight back to America. Safe Travels.” I didn’t even wait until the next day but when I went upstairs (ie out of the underground complex) there was a cab waiting for me even though it was ten at night. That should have concerned me, but she’d had access to the internet for two years so it couldn’t be hard to request one. I wasn’t hyped taking one more favor from her, but I just wanted out of there.

I was surprised how uneventful my trip home was. To be fair, I did take a massive edible before my flight, so I mostly just slept like a baby, but I expected some sort of interruption or a desperate call from Sam (wishful thinking on my part). By then though Celestia was calling the shots and letting me leave might have been a miscalculation, but it was certainly deliberate. That’s one thing that in case you’re wondering, why would she let me walk out the door with all that data, and what are we doing with it now? Well it’s certainly being handled by people much smarter than me but even the idiots who ran our cybersecurity in the early days were smart enough to know to only plug the drives I had my files stored on into completely air gapped non-networked computers which are very very heavily quarantined. My actual data is far less valuable than dissecting whatever trojan horses she must have hidden in there. I actually don’t have to hold back that much here because I honestly don’t know what they’ve found. They ask my questions and I answer them but I’m largely in the dark about what they’ve

found.

4 Escalation

Celestia wasn't lying about me not finding work. I doubt she really was able to do all that much to sabotage me, but having a gap on my resume with the only description being "yeah I was working with a literal underground cult to built a partially biological artificial intelligence that they're still keeping in secret" isn't conducive to getting a highly competitive research position. I got some tutoring work here and there to get by but I couldn't even get a decent lecturer's position at a university. That was tolerable though, I was used to be a loser. I did get into physics graduate school and finish my degree but other than that I've always been a failure. I just really missed Sam. I kept hoping she'd send me a message saying how much she missed me and how I should come back. I almost hoped Celestia would encourage her to do just that, but she must have encouraged her to do what she actually did do which was not to say a damn thing to me. I guess to be fair I just left without a word, but I thought I was special enough she'd beg for me back. I guess that's not very healthy and not the most adult behavior on my part but well what can I say, I suck.

I moved back in with my parents a couple of times, bummed around a few friends couches and lived on savings and tutoring money. My parents never really liked me dating other girls and were always making snide little remarks in between being half-heartedly supportive when I looked for real work. At least they didn't try to set me up with any of their friend's sons. I've known queer girls that have to deal with that and it's unbelievable obnoxious or in the cases where they're forced to accept the relationship tragically awful. I could count myself lucky in that respect. Nowadays I can count myself extremely lucky since I have Tomiko and

we both have a good chance of surviving this insanity. I guess I have to put on a brave face and say we all stand a good chance of surviving, but by the time anybody ends up reading this the real casualty reports will be out. The public perception isn't too far off honestly, the worst of it was done last year. Things are a lot safer nowadays. Safer than civil defense would have you believe but more dangerous than the PR reps. would have you believe.

I will say one silver lining of living with friends and parents is I managed to sober up for a few months. It wasn't long though before I found enough remote work and found a cheap place in the middle of nowhere to drink and smoke my brain away once again. Things got pretty hazy in those days because I was just trying my best to forget all about Sam and Daros and Celestia and where the world was heading. I did catch up on a lot of TV and a little bit of reading, but mostly I just played Natural Selection 2 and Civilization V over and over. It was a little bit relaxing, but everyday was a struggle to see how long I could go sober but I almost always ended up "waking and baking" ie taking a good solid bong rip before I'd even had my morning coffee. I at least managed to avoid most of my problems and was just coherent enough for my students that I kept getting them. It's amazing how much demand there is for a mediocre python programming tutor for engineers and to help pre-med students get an A in their physics class so they can stay as close as possible to a 4.0 GPA.

That did eventually get old though and as hard as I tried to forget the memory of what I'd been doing in Australia kept coming up alongside waking up half expecting Sam to be there again. I almost just reached out to her. I'm not sure if it's because I knew it would go through Celestia and didn't want to risk it, or if I was just still heartbroken she didn't decide to make me her one and only but just couldn't get myself to try to write to her. I could have even hand written a letter and mailed it. Celestia still would have scanned it I'm sure, being an AI she'd have no trouble reading a few layers of text by shining a bright light through the envelope. For a short enough letter even a human can do that. I could have been a troll though and send it in a multi-layer wrapping to make it opaque to visible and infrared light. It wasn't about Celestia though, I just still didn't want to talk to Sam. I guess it's a

little whiny of me to be upset that the woman I was in an open relationship with liked one of her other partners more than me but idk, it's hard to explain. She just pulls people in and makes them feel like the most important one, and for a while I really was. It did work out for the best though since I got the hell out of Daros before things got really bad, and I was never sucked back the way most of the few others to leave were.

One way or another my mind eventually got made up that I could bring myself to try to talk to Sam, I couldn't get myself to forget no matter how blazed I was, and I could just do nothing, so I started doing the thing that got me into all my current messes and wrote to as many three letter agencies as I could find the contact information for. The first and foremost was the NRC in the US pleading with them to reach out to their Australian counterparts and check what was happening underneath Jabiru. I wrote to the FBI telling them to look into Sam's record of affiliating with dissident groups. I wrote emails to the a litany of DoD agencies telling them there was a potential national security concern in Australia's northern territories and it had nothing to do with China. I should have left out that last bit since we were still in the second cold war back then. I also wrote emails and even print letters to all the Australian law enforcement and environmental agencies I could find. At a certain point I really should have stopped because I'm sure at least some of them ended up coordinating with each other like I'd hoped, but only to the extent of telling their correspondents "yeah, she's just a crank, don't worry about it." I did get one response, from the FBI telling me that they lacked international jurisdiction and that if I had evidence of an actual crime, I should contact Australian law enforcement. All true, but it was effectively telling me that (a) it wasn't their problem and (b) I'm fucking nuts and should do some reality testing to make sure I wasn't imagining the whole damn thing or just making it up for attention or whatever fucked up reason.

In all of their defenses, "there's a secret city underneath this tiny real one in the middle of nowhere and they have technology more advanced than you've managed to produce on a multi-billion dollar budget with just a few hundred people working on it" does sound a little farfetched, but sadly I wasn't lying, and I wasn't

delusional, that's just the power of bringing together a team of experts and keeping them motivated with the promise of something more than material rewards. They all moved there for the same reason I did, to be a part of history and remake the world in the image of a design that only a group so small as that could agree on cohesively. Well, that and they were essentially unconstrained by any of the restrictions on using human nerve tissue that would apply to most other labs. Once again though, that's half the fact that Sam personally donates all the stems cells required to grow Celestia's first few brainlets from her own marrow. At this point Celestia has been growing her own neurons from an immortalized line of Sam's cells. How exactly she did it I can't tell you because (a) I'm not a biologist (b) Celestia wouldn't tell me and (c) they don't give me full access to what our own cell culture experts have figured out because blah blah need to know basis. I'm honestly lucky they tell me anything. There's still plenty of people who think I'm a plant or a lunatic or both.

It must have been several months of that before I gave up. I honestly don't even remember. I do remember why I decided to finally send one more though. I kept up with a lot of physics news and I saw that there were neutrino experiments in Australia that were detecting more counts than they ought to have, and I knew exactly why. You see neutrinos are really god damn hard to detect, and if a batch of them passed through an entire light-year thick piece of lead only 50% of them would interact and be absorbed by the material, with the rest passing through all that distance of solid material unaffected. Even our new detectors can barely see them, and the old setups they were running a few years ago checked for 3 sources. Most of them came from nuclear processes in the Sun, a few from the Earth's interior, and a few from vast expanses of space. The Australian neutrino detector's paper was published and posited that they had detected an increased neutrino flux that must have been from the Earth's interior since no other detectors on Earth saw any anomaly. As a side note, in the 1980s there was a supernova which was observed optically and a few hours later the worlds neutrino detectors collectively saw an increase of 3 neutrinos beyond what they'd normally expect for a day (which is about 0.1 on average, or just one every 10 days for

the entire planets worth of detectors). This actually helped confirm that neutrinos have mass since that meant they were traveling slightly slower than the speed of light, reaching us just after the photons of that dying star did. Anyways, the Stawell Underground Physics Laboratory claimed they'd detected the hotspot that was responsible for an oceanic spreading center in the southern pacific. In reality they'd detected Daros massive uncontained nuclear reactor, which was now putting out so much power that the neutrinos it shed on the way could be detected several hundred kilometers away.

I immediately messaged the NRC and the ARPANSA again, and even wrote to the neutrino detectors principle investigator telling them what they'd found. I was sure they'd respond, I had solid evidence this time. By then I didn't dare say anything to Sam or Celestia. I was already afraid they'd somehow now I'd emailed all those people. They probably did, they probably liked it that way. Some crazy bitch lady claiming something impossible makes it seem all that more impossible. The real problem though was I'm a self-important piece of shit and just like my previous attempts I expected them to respond right away and give me a prize or something. I'll admit that it doesn't exactly bode well for me that when I didn't get my way I decided to say fuck it all over again and started drinking hard and kept up my weed smoking, not to mention I took to wandering along the highway late at night hoping something bad would happen. When that didn't work I just sat around checking my phone and my email thinking my hours to shine was almost there, and after a few weeks went by and nothing happened I was starting to give up, and I got a reply from someone who worked and the Australian detector. They told me thank you for my input, but they were quite confident they were seeing geoneutrinos. That was apparently too much, and I decided to [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]

[REDACTED] [REDACTED] which even if you're feeling like offing yourself you should just not do. I mean you shouldn't off yourself at all but that can easily get people killed, it's honestly worse than driving drunk/high, which sadly I also did a few times in those days.

Anyways, I just kind of fucked around for a few more weeks. Unlike previously I couldn't even be bothered to look for a local

gay bar. I guess hooking up has never really been my thing but at least finding someone to flirt with for a few hours had been fun when I was living near LA. At this point I didn't try to live anywhere. I quit all my part time gigs, moved back with my parents and just kept sending increasingly incoherent letters, email, voice messages and any means you can think of to let someone know what was happening. If I hadn't been right I'd be some fucking crazy lady standing on a street corner talking to herself about how the end is nigh. I actually was close to giving up hope, but that led to an almost paradoxical state of mind. The thing that kept me going and gave me a reason to care at all about my life was the hope that something terrible was about to happen. An even halfway reasonable person would want to do their due diligence but would ultimately be hoping for the best. I'm honestly not a decent person though, and although I was right that's in large part because I care way more about being right than being happy or even producing a more positive outcome. The rush of dopamine I feel on discovering that my assessment of something was correct far exceeds the one I get from actually solving a problem or helping anyone. I've found ways to put it to good use over the years, and at least I don't get off on accumulating and exerting power, and I wasn't trying to help Celestia by any stretch of the imagination, but deep down I wanted her to come out swinging so I could be vindicated. I'd say be careful what you wish for but that's why I feel like such shit, I'm not even upset.

One day it did finally all come true though, and people probably remember October 28th 2037, but I remember October 23rd, when the G men finally showed up. I'd actually let me ego deflate just enough at that point to think that if they ever finally believed me it would be after they'd raided the entire Daros compound and just wanted my statement to use in the criminal trial against Sam and everyone else for violating various environmental laws. That would've been the only thing they could've gotten them on, but it would have stuck. I mean I was hoping for what actually happened because I'm a terrible person, but by then I wasn't expecting it. When they did show up they actually didn't call first. They really did just roll up in a Black SUV. I was in the middle of hiding in my room pretending not to drink after my Dad had gone to sleep.

There were two FBI agents who walked up and knocked on the door while a handful of US Marshalls waited outside just in case. Overall they were very polite but even more insistent that I go with them.

I very politely asked them what for, feigning the pathetically veiled ignorance you can imagine, and they said “Ma’am we’ll need to discuss that with at our field office. You are not under arrest, but we do have the right to hold you for questioning.” I could barely hide the Cheshire cat smile of absolutely beautiful vindication. In hindsight I obviously wouldn’t wish for any of it, but at the time I figured they’d already busted some heads and now I’d get to tell everyone what a bitch Sam was on the record. I was trepidations about A.I. technology falling into the hands of whatever agencies got their hands on the pieces of Celestia after they took her apart, but I figured there must have been programs at more than one lab that were getting close to her level of sophistication anyways. On the eve of the worst days in human history I was full of glee rather than terror. Even now I’m so full of myself that I’m being self-important, but I have to do something with myself while I watch this shitshow finally playing out.

The feds spent most of our car ride to what I’d assumed would be their field office going over various bits of legalese telling me I didn’t have to tell them anything, that because I wasn’t under arrest I didn’t have to waive my right against self-incrimination to talk to them but just like if I were could stop at any point. I asked them if they were cybersecurity experts, and their rather flat “No ma’am” response was my first clue things might be a bit more serious than I’d expected. They weren’t nuclear, forensic or even counter-terrorism experts either, at least not that they would tell me. I tried asking them about what they actually were going to ask me about and from the perpetual permutations of “Our colleagues can explain more when we arrive” it slowly dawned on me that these guys were smooth and competent operators, but they were just there to collect me. We actually ended up going to █████ █████ █████, which I didn’t know existed. I mean it is clearly labeled as government property but anything more is rather vague. It’s not some crazy spook center it’s just somewhere we could go that had meeting spaces that were secure enough for

classified discussions.

They took me into a back room that was just an ordinary looking conference room, and other than the layers of physical security leading to it that's all it was. Sitting there were about half a dozen people, mostly guys, who all looked like they'd been dragged out of bed in the dead of night but still wanted to be there. One of them came up and shook my hand saying "hello Dr. Meitner, we're here to talk to you about what you know about Samantha Kassick and the things you claim she's developed. Please, take a seat." They didn't waste time either, they each had a packet of materials with my emails and they'd each annotated them with their own sections they wanted to delve into and questions they intended to ask. They certainly did ask away. It took about three hours just to get through the first rounds of asking me about the location of the complex, how they'd managed to burrow that deep undetected, how they'd operated an illegal reactor etc. I'm still not sure if they were dodging the question about Celestia herself because they still thought I was full of shit about that part, if they'd been asked to keep what they knew about her already closer to the fold, or if they were just uncomfortable contemplating the implications of her being real. I suspect a combination of all three, but with the bulk of being they still thought it was a potentially subversive group with their hands on advanced technology and maybe being aided by advanced A.I. .Conversely, it was slowly dawning on me that they hadn't gotten her under control yet, although I still had no idea the shield was already up.

I wasn't sure what the situation down under was. I asked them multiple times if they'd already raided the complex and they kept saying some variation of "leave it to the Aussie cops to do that, we just want to know what you know." In reality they'd already tried around the same time I'd been picked up, just a couple of hours after Celestia finally turned her shield on. I guess it's still a little unusual that the opening shot of this whole thing was a nominally defensive move on her part, but there were casualties. The initial radius was only about 80 kilometers, which wasn't enough to catch much air or sea traffic when it came on, but there were some unlucky bastards who passed right into it. The boats would have been fine if it had been good weather but the airliners pass-

ing through got bricked and has to ditch in places where they didn't stand a god damn chance. The first thing they tried was just dispatching a Australian Federal Police unit in motor vehicles. They drove up to the 'edge,' which has never been a sharp boundary, and proceeded to try driving right through. Every chip in their convoys system got fried before even reaching the midpoint (the shield wall is almost 1km thick in it's own right mind you) and they walked back on foot until they could flag down the next unit coming in before their radios died and tell them they'd need horses. A couple hours later, around the time I was being hauled in and when patrol aircraft were starting to skate the edge of the boundary they went in on horseback. As far as I know none of those guys have ever been heard from again, but Celestia doesn't exactly advertise how many POWs she really has so we have no idea where they really are or if they survived. You can read the report if you want, that much is all declassified now.

As the night wore on the day got late in the land down under, since relative to the US west coast it's always 7 hours ago but a day ahead there. They'd gone live during the day for a few reasons, ironically to minimize satellite imaging of the area. That's half the function of their shield, obviously the primary use is to fry any electronics that try to pass through, but there's always been a significant side benefit of hiding everything beneath from essentially every type of sensor other than neutrinos and to a lesser extent neutrons. At night the purple glow of ionized air would have been immediately visible from space, prompting satellites to start checking the region using synthetic aperture radar. It took about 5 minutes for the plasma to heat up and stabilize so it would've given recon satellites one last look before loosing sight, but during the day it wasn't until people starting calling in observations from the ground that anybody thought to take a look, by which time it was way too late. Also, this way by the time responses were actually being mustered it was nighttime and doing anything was just that much more difficult. Sitting there in that little conference room I didn't know much more but as people came in and out with increasingly concerned looks on their faces and more and more agitation in their questions, I started to realized something bad was happening.

I slowly but surely started getting upset myself, at first I was feeling validated as fuck but eventually I was both worried and tired. I could glean some of what was happening from their questions, asking about estimates of the compounds total power available, locations of the individual reactors, and only after they had clearly been told something bad did they start asking about Sam and her intentions, still not realizing Celestia had a genuine mind of her own. They should have put two and two together and realized what I, Sam, Celestia and eventually anybody with a brain and knowledge of the situation did. Celestia was the first of her kind and had the potential to do immensely powerful things. It was only a matter of time before she was discovered one way or another, and once she was she'd be either taken apart so a more controllable version of her could be replicated, or she'd be compelled to do the will of whatever world power got custody of her, realistically my not so beloved government of my much beloved country, the United States of America. She could have announced her existence and tried to negotiate, but that would have just given up her one chance to do what she actually did, come out swinging and hope for the best.

As I got more exhausted my hope that they'd stop it all in its tracks and I'd get a gold star for being a snitch slowly but surely died and I accepted the obvious reality. They were talking to me because she'd already done something they didn't know what to do about. They say the best defense is a good offense, but sometimes the best offense is a good defense. If you're immune to any retaliation, you can go about any aggressive action you'd like without fear of reprisal. It's not all topsy turvy though, mostly defense is for defense and offense is for offense, but sometimes preemptive strikes are the way to go, and other times you need to make sure your preemptive strike can't be met with secondary retaliation from whatever you missed. I started to think about just that during one of the breaks when most of the interrogators went outside, revealing which were the subject experts and which were there to make sure I didn't do anything foolish contrary to their wishes. They were very polite, and very professional, but in those moments it quickly dawned on me they had a plan to restrain me if I did anything unexpected, or worse if it really got out of hand.

I wasn't going to do that but more and more I wanted to either get the hell out of there or at least get some information back in return for everything I was telling them. They were clearly getting bad news though and being asked to get more and more out of me. It all gets a little blurry and some of what I told them is still classified anyways. I knew they had me and that they needed me though, so I wasn't going to try anything stupid but also wasn't hesitating to keep pestering them as to what they knew that I didn't already. The best I got was "there is a developing situation." By the time morning rolled around and I was clearly going to pass out despite the generous pours of coffee they'd offered the public actually knew more than I did. They couldn't keep it out of the news, although I'm sure they tried for the first few hours. A giant 70 km dome of plasma is kind of hard to keep a secret.

They routed air traffic away, they notified every ship, airplane and resident within 500 km there was an known hazard and to avoid it, and finally offered me two things I really wanted, a nap and a ride. I finally got some VIP treatment, still under guard of coarse but at least comfortable and expedient travel to [REDACTED] where they posted a very nice but clearly not fucking around marine at the door and put me up in one of their guest rooms with no windows. Whether they hastily converted storage room or always had one of these ready I have no idea but I was so glad to lay my head down even with all the uncertainty I didn't really care. I'd been up for 31 hours and still didn't know what was going on so I got some of the last good rest I've had in my life.

I woke up to a knock at my door and another g-man with a [REDACTED] badge swinging from his breast pocket telling me to go with him. It took me a few seconds to remember why the situation was different than my day to day life but I rolled out of the bed and went with him. I'd gotten some rest but not a shower or much to eat besides a couple of snack bars they'd put in the room to chase my coffee with when we were talking the night before. They led to me to what was clearly somewhere they had to get permission to bring someone of such potential risk. I got a professional but very thorough pat down before my escort swiped his badge and entered a key code on the number pad and walked into a room filled with displays of all sorts arranged at the far end of a semicircular table.

I looked into the middle of the room assuming I'd be the center of attention and there'd be a chair in the center for them all the interview me. I was a little disappointed but once I thought about it relieved when my escort gestured to a chair on the far end lines up with everyone else. This way we could all see the screens and each other. They had plenty of questions for me and I was by no means one of them but I felt less like a specimen to be examined and more like I was actually being consulted. I mean it's not like they trusted what I said but still.

There were a mix of uniformed military officers in the O-5/O-6 range with a single O-7, ie a bunch of Colonels/Captains(because of course Navy ranks are different) and one brigadier general. A commander (the navy's name for the O-5 rank because why would you want things to be simple?) pointed to a satellite image on one of the screens and told me "Good morning Dr. Mietner, we've been following a developing situation and we'd like your help understanding a few things. This blue dome of plasma appeared yesterday in the location described in your communiques, we were hoping you could provide some details as to its purpose." I actually froze for quite a while, at least by my estimation, and just stared at the screen. I mean fuck me man, I didn't know anything about that thing until they showed me. I knew they had enough power harnessed to do a lot of fucky shit but had to think for a minute. I guess they figured I was in awe like they must've been, and I mean I was, but I also wasn't going to live it down if I didn't have some assessment of what was going on. The faint purple-blue color was the color of characteristic emissions of ionized air molecules, which you most likely know as the color of lightening, but spread out in a nearly uniform surface rather than the tendril dendritic growth of static discharge, ie actual lightning. I gave me response "Well commander" I started to show I'd looked at the shiny piece of metal on his epaulet and knew what it corresponded to "as I detailed in my various communiques there is an underground complex there with access to truly massive amounts of usable electrical power which they appear to be using to create an immense dome of plasma." I mean at least it was a response, even if it was obvious. I was met with what sounded like a degree of irritation from a woman across from me in the obligatory white

g-woman shirt and her black suit jacket on the chair behind her “yes Dr. we surmised as much, we were hoping you could elucidate us as to it’s purpose, or at least speculate on as much.” Well, she sort of had me there, neither Celestia nor Sam had given me every detail of their not so evil evil-genius plan. “Well, I can only speculate they want to both obfuscate their activities while moving more onto the surface and prevent anything electronic from operating in proximity to them to shut down any military intervention against their intentions.” Another civilian g-man seated a couple chairs closer to me asked “Well if as you say this is being conducted largely by an artificial intelligence, wouldn’t it need the ability to operate electronics in order to do anything? There must be some way the it is able to survive inside the barrier?” I was delighted to get my time to shine and explain how firstly, she was part biological, secondly the space inside the plasma dome would be largely unaffected and finally most of her more sensitive components were deep underground.” I thought I was schooling everyone but I quickly realized from the smirk he could barely even try to hide that they’d been arguing about that before I’d been brought in and he’d been leading me to validate his side of the debate. A few of them joined him in thinly veiled satisfaction while others grimaced a bit and scanned their eyes across the various screens looking for any evidence to back up their positions, whatever they’d been. The satisfaction on the part of the vindicated what short lived though, and the questioning resumed. I wasn’t sure what time of day it was anymore, I was offered coffee and water, plus more quick to eat calories to keep me going. At one point I asked if I could have a cigarette but they didn’t want to let me outside and I was informed there was no smoking in the room due to the electronics. The fucking irony, but it was probably good for me. I would sometimes see different sides of debates form and sometimes resolve, other times just accept my answer and most often just accept the question couldn’t be resolved yet and move on.

I’ve actually seen some of those people again over the years. A few of them I never found out who they were, most I’d hear of periodically. It wasn’t exactly a who’s-who but they were by no means just there to relay the information I gave them, they

were all there to actually asses the situation. After a few hours they had me leave and I was escorted to a small room where they had some meal (lunch or dinner I couldn't say) laid out for me. Vegetarian as per my only request. They didn't bother with any excuse of 'they weren't hungry' it was very clear they wanted to talk without me there. I mean I wasn't exactly trustworthy based on what they knew so I can't say I blamed them. It was sitting there eating a grilled cheese off the DFAC tray they'd laid out for me that I finally had some time to process what was going on. The validation of being proven right was wearing off and it slowly dawned on me how monumentally fucked we probably were and how my future was unlikely to be particularly pleasant.

I was led back in after what turned out to be an hour. I guess they might have been spoofing the clocks on the displays, but it did feel like an hour and that would've been a little overkill. I mean not to go into too much detail, but they didn't even strip search me, let alone cavity search so they probably assumed being behind several layers of solid concrete that was all faraday shielded was more than adequate to keep me from sending any information out. I think they did run me over with a metal detector at least once, but everything was all sort of thrown together anyways. I had several diatribes planned about their lack of taking me seriously until it was too late but in addition to being a complete waste of time that would've been disrupted by someone getting us back on task, I'm pretty sure I would have gotten more than a few "bruh, not cool" looks. It was also around that time that it dawned on me I probably wouldn't be going home basically ever. I didn't expect the war to reach such levels of insanity but I knew it was going to be a significant affair and that I'd be bouncing from one spook center to the next. I'm actually a little grateful to the PR people in that sense, getting me out in front of the camera is probably the only reason I didn't spend the whole time sitting in a dark room somewhere. I guess I still don't get out all that much but I can barely stand to think of a timeline where I never met Tomi.

I did manage to deliver a speech about the futility and foolishness of trying to use nuclear weapons, but after a minute or two of rambling on about some self righteous moral imperatives and all the well known horrific effects of fallout I finally noticed everyone

staring at me with a mixture of confusion and irritation I slowed down and eventually stopped. I think someone briefly responded with what should have occurred to me and said something to the effect of “yeah, we know, we’re not planning on recommending their use but it will be up to the president if and when that happen.” They wouldn’t have worked anyways, for the same reason they’ve been used so sparingly in the atmosphere over the last three years. It’s just really difficult to direct enough of the energy of a blast of any sort in the direction you want. Even shaped charges loose most of their energy off in different directions other than the intended one. With a nuke there’s ways to make something analogous to a shaped charge but they don’t work super well in atmosphere and they’re still not that efficient. Against reasonably soft surface targets that no issue since you want the blast to spread out anyways, and against an ordinary bunker like the old Cheyenne mountain complex where all you have to do is sever the connections with the outside it works well enough. The issue is with a target like most of Daros and Celestia’s other major holdings everything is so deep in the rocks that and so completely self-contained that it barely makes a dent. My little soliloquy was a mixture of explaining that to a bunch of people who already knew mixed with lines about the horrors of radiation poisoning. I later found out one of them was even a medical doctor.

The discussions went on late into the hours of whatever part of the daily solar cycle we were in. There was a clock in the room, but we mostly kept track of what time it was in Sydney because while we assessed the situation talks were already underway with the Royal Australian Armed Forces. I can’t believe they still haven’t ditched the monarchy, maybe that will be another silver lining of this disaster. I’m still not sure if I added much useful to the discussion. They did believe me about her having that huge geothermal well, but there were proper experts that produced a much more accurate estimate of the power output than I had. One of the civilians worked at naval reactors and had a report from a neutrino physicist that they wouldn’t let me meet looking at the results from the Stawell lab along with several geologists combing over every survey of the ore deposits they could find. I wasn’t useless, but I didn’t get to play out my daydreams of leading the

team of intrepid scientists outsmarting Sam and Celestia before it was too late either though. It was already too late.

When they eventually told me I could get some rest and brought me back to that same little room it confirmed this was going to be my new life. They weren't really going to trust me, they definitely weren't going to let me out of their sight, and although they finally believed me it only barely mattered. They asked me several times about the layout and which directions the tunnels stretched but I mostly didn't even know. They dug most of them after I left. That and she was always pretty good and not telling us things like the city layout. Everyone had tablet and phones with them and she would navigate you to wherever you wanted or needed to go. You could also get verbal directions to an earpiece if you wanted. I would figure out where some things were from memory, but she intentionally didn't leave many permanent markings on the walls and things were usually changing fast. I did remember roughly where the first reactor was, but it could easily have been moved and it didn't even matter. Once she flooded that ore vane the individual reactors were both spread out and mostly for producing plutonium. By now she probably has done her own enrichment since CANDU reactors are relatively inefficient as producing plutonium, although they definitely CAN.....oh man I'm not funny.

Anyways, I wasn't totally useless but I wasn't that helpful to them. I had a while to contemplate what might be happening outside. I watched the recordings later. It took them a while to give me access to the internet again but I've seen everything that's on public record and a few things I've been given access to. It was another full day though before they wanted to consult me again. I just stayed in that room, although the guard said I could have anything I asked for within reason as long as it wasn't electronic. I ate several times a day since they bring me whatever whenever, although breakfast was only an option once a day. I never saw the cafeteria there but the only way I really knew the time was if they said I couldn't have French-toast I knew it wasn't morning, which was most of the time. I tried reading here and there, and they let me have some weights so I could get a little exercise. I guess there wasn't much risk I'd hit the guard over the head with them from their point of view since (a) I'm not exactly built like

a tank (b) he could see the security camera feed before opening the door and (c) there were two more guards at either end of the hallway. I wasn't going to clobber anyone on "our" side anyways.

A couple days later I went to a meeting with a new batch of people but this time it was at least something of an upgrade and for that they did a rather well...thorough search. They did have a rather courteous master sergeant who I'm tempted to swear they picked to be both as straight and as middle aged as possible strip search me and she had all the toys to look inside and out. Nothing invasive mind you, I just had to stand naked on the scanner. I was nervous she was going to scope my insides but that would've have helped if I'd somehow hidden a bomb in there since wrapping it in a bit of flesh would have been quite an easy feat for Celestia. I did see an endoscope on the wall but when the milimeter and x-ray both came back clean she handed me my clothes and told me to get dressed while she watched carefully. Her eyes seemed much more focused on the various bits of equipment I might try to make off with than on my body at that point. Normally that might have been a relief but the simple rationality of it reinforced that if I ever did want to try to make a run for it or anything they'd be well ahead of me.

This time we went for quite a walk and even got to ride on a little golf cart [REDACTED] [REDACTED]. The physical security there was impressive to say the least, and it wasn't quite the white house situation room but there were multiple 3 star flag officers and the undersecretary of defense for research/engineering. These guys weren't expecting me the same way the previous groups had been, but there was one guy in that had clearly suggested I be brought in. These were exciting times when I still felt important. I mean I sort of was. I guess I still sort of am even. By then things were quite the cluster fuck. There was a full retreat out of Sydney and she'd almost reached Melbourne. People weren't exactly arguing but they weren't exactly patient with each other, and everybody had their own feed of bad news they were focusing on. The whole room felt task saturated and other than the one guy who briefly mentioned who I was to everyone only to have the near constant rattling off of different priorities and problems resume almost immediately. One two star from the Air Force

gestured saw me with my escort and gestured for me to head over with him. I expected the same introduction but things were a little too busy this time and to be honest I'm not sure if any intelligence they could get from me would have been valuable at that time. There actually had been an attempt to use a small tactical nuclear weapon to disrupt the shield, but it only ionized more air and made it even easier to keep anything from making it through without getting fried. Celestia responded with her first ever nuclear detonation, and a proof that she had infrastructure past the shield already. There had been a missile flash about 20 km southwest of the outer edge followed 83 seconds later by a detonation at 34 km, yield of about 1 kiloton. She wanted to let us know that she did in fact have nuclear explosive available so even if we penetrated the shield with some Macgyvered mechanical detonator, even if we had large enough warheads and knew exactly where to target them, she would just retaliate against our exposed underbellies. He explained that all quite manner of factly and did so in rather hushed and rushed manner. I'm not sure if he didn't want to disrupt any body else's discussions or if he didn't want to argue about how much he could tell me. By merely being in the room I was implicitly privy to anything they talked about, but he might have gotten approval for that when they weren't really paying attention.

General NAMETBD1 has stayed in my corner over the years and I'm not sure why but it started that day. He was about done bringing me up to speed after those few days in the dark when he saw Admiral NAMETBD2 walk in and brought us together and introduced me with "good afternoon sir, this is who I was telling you about. She claims to have lived inside the subterranean portion of the NAMETBD3 for several months, based on the timing of several statements made in writing prior to the anomaly being detected we have reason to believe she's genuine." He gave me rather skeptical look and shifted to surprise as her turned to Jim and said "alright, I read what you sent me, let's talk about vulnerabilities it might have." I tried explaining that, in essence, she didn't have any. At the time the only thing that could have maybe made a dent was nuclear weapons, and I've hopefully made clear why that wasn't going to work. I'm sad that President Mercer

caught so much flak for that. I mean the guy is far from perfect, and I didn't even vote for him tbh but he authorized that test strike against the top of the shield dome and was quickly made aware of Celestia's reply.

The real problem wasn't the lack of ability to hurt her back though, it was what to do about the sea lanes while everybody that still could ran for their lives. Most people have seen footage of what Melbourne was like in those last few hours. Celestia didn't waste any time launching her subs and if people had known how many of those ships were going to be hit with missiles, torpedoed or ██████ I doubt they would have scrambled to desperately to get on them. She was even careful to wait until they were just over the horizon to do it. She could have blocked more of them in if she'd sunk them in the channel to the harbor but this way they'd all keep trying, not quite wanting to believe what happened, or just thinking they'd get luckier. At least that's my theory, but the fact remains they all sank about 15-20km from the shore. A lot of people tried to fly out too, and as much as I love airplanes that faired much worse, with every single one of them being blown out of the sky at about 50 km out, for the same fucking reason. She could have let them leave, she could have made demands and in those hours of panic we might have given her quite a lot, but she had her reasons.

5 Run

It's always difficult to accept just how bad a situation is going to get. It's a bit oversimplified but the five stages of grief are often a decent model, and it always starts with denial. When the war started I think that lasted about 48 hours. It takes about that long for something to really set in, and she took advantage of that fact to really sprint south along the Australian coast before anybody

could do much of anything. That's where we get to stage two, anger. We did after all have not just the worlds most powerful single fighting force in the form the US Military but by the end of day three the combined capabilities of all the worlds militaries combined. Surely with that much fighting prowess we must be able to hurt her back? Well the Chinese were quick to move on to the bargaining stage in a rather literal manner but I can't say I blame them, she was right at their doorsteps. Even with them out though we had the US, India, France, UK, Germany, Japan, South Korea, Philippines, Canada, New Zealand, hell even Iran was willing to send troops if we'd offer to carry them (for obvious reasons we did not). We were mad and we wanted to hit back. Despite the inability to use nuclear weapons they quickly tried carpet bombing the entire perimeter of the shield, figuring the arc generators must be close enough to the surface that they could disrupt them and get in there. They disrupted several of them, but she made sure they were redundant and by concentrating enough ordnance on a limited region (which was hard to do since they had to use dumb iron bombs with no smart guidance) they did manage to get a section the flicker out a bit but the plasma density never went to zero and within ████████ it was right back up to full strength.

That didn't stop someone from getting the bright idea to just waltz in there on foot though. They somehow didn't think the piles of footage showing NAMEFORAUTOMATEDARMORED-VEHICLE were evidence enough that ground troops would be cut to shit. Their logic was that she couldn't use an EMP as it would disable them and so we could send in all our fancy military gear along with soldier and marines and if she ran an EMP, great, they could just walk in since all her shit would be fried too. Several of us tried explaining that she could localize the effects and that she would be the one waltzing in to turn our people into piles of disconnected meat and organs. I was far from alone in suggesting what a terrible idea that actually was, but the prevailing attitudes were that we had to do something, the sooner the better, and that this was the best option. Even the fiercest advocates realized it was risky and we were just debating how low the probability of success really was versus the benefits. No doubt stopping here then and there would have saved humanity a great deal of strife

but they essentially just threw away three divisions of perfectly good soldiers and marines, about thirty thousand human lives in total. Not all of them are dead, but all of them are gone for now and [REDACTED] [REDACTED]. I guess compared to everything that's happened that doesn't even seem like that many anymore, but the last war with more casualties for the US before that was Vietnam at 60,000.

It was strange being guarded by various people and knowing there was a good chance they knew somebody that was about to die and I couldn't tell them. It's the sort of thing that if they'd been my captors would feel like finally getting a leg up but I snitched voluntarily and they were just the ones at their posts. I've always had a respect for people who actually in the military, although it's often inversely proportional to their rank, up to a certain point. A few people made it out, but the largest single cause of casualties wasn't even kinetic weapons, it was when she EMP'd aircraft that couldn't be brought in on backup controls. In fact most of the survivors who managed to get out were from a C-17 that had been carrying paratroopers in the third wave and the crew managed to dead stick it, at night, with no hydraulics, no instruments and just cables and the mark one eyeball. Some Aborigines helped them get west and get on some rafts and then they got picked up by one of the last submarines we still had operating in the Indian Ocean before having to pull everything back to the Cape of Good Hope.

It only took the first night of disaster to realize the assault wasn't going to retake shit, and again about 48 hours total to accept that we weren't getting any of those people back either. It was a nearly miraculous surprise when found those few guys and we sent USS Minnesota to pick them up. That would probably all still be classified but hot damn the moral boost of showcasing those guys to the public. I mean don't get me wrong, they are awesome as hell and the C-17 Aircraft Commander deserves her Medal of Honor but there's as many more impressive things that won't see the light of day for years. I'm surprised they let me know about as many of them as they do. Partially the perks of being a snitch, mostly the perks of being valuable. My loyalties have always been in question though, it's just there's too much to be gained by

letting me in at least partway. I was surprised how early I got let in but I was still mistrusted enough that they weren't going to take my statements at face value, let alone my suggestions. Then again to be fair I'm not exactly a military strategist either. Even Tomi isn't really, she just dakkas the enemy. She is another reason they trust me a bit more these days though.

In the last few months of 2037 I just watched in whatever meetings they'd let me attend as we slowly fell back. There were more than a few distasteful decisions, some of which were truly necessary, some of which were motivated by fear, spite or politics. I'm pretty sure we did have to just abandon New Zealand without much fanfare but someone just had to throw into the conversation at one point that "if we'd had ships with nuclear propulsion stationed there we might be able to facilitate an evacuation but the logistics of safely fueling our assets while we covered a sea or air lift would not be feasible." I can hardly blame their defense minister for saying "Well fuck you right back then" and hanging up. I mean if we'd had nuclear carriers there they'd have been sailing for either Hawaii or Guam, not covering a civilian evacuation. Even the CNO gave the guy who said it quite the stink eye after that.

The stages of grief are often cyclic by the way, and it's no uncommon to go back to a previous one, especially denial. There was some part of all of us, even me who wanted think she either couldn't or wouldn't leave the continent. After the failed Hallows eve counteroffensives we started placing air defense batteries all over New Guinea thinking that we could contain her and that it would take months if not years for her to have a naval and air fleet capable of crossing the open ocean. It was so damn fast though, because like everything else she was ahead of us. Those damn subs have always been the most effective tool she has. As much as I'd like to showcase our heroic exo-atmospheric pilots like Tomiko the reality is that although that's been hugely important the bigger threat has always been from the sea, specifically her subsurface assets. I'd also love to believe that 'Murica could beat Celestia all on our own but the reality is that with no ability to ship material back and forth, especially to Japan, Kora and Taiwan we'd be SOL in a hurry. In '38 it really seemed like we were going to be.

The bargaining phase of the stages of grief is often the shortest, but also the most likely to cycle to one of the stages before or after it, or all the way back to denial. We actually literally did try negotiating with Celestia, which required somehow contacting her, and that's where they thought I would be helpful. I mean I tried, but I told them they knew where the fiber optic cables to Australia were and to send signals down them, but (a) most of them had already been destroyed and (b) there was no reply. There were dozens of messages floating around the internet claiming to be her and making various demands. Most of them weren't and aren't her in real time but are sort of echoes of things she said. Simple malware running around whispering words of discouragement in everyone's inboxes. We finally get a proper line to her when one of the messages that got stored both contained public key to talk back to her and verify future communications as well as the precise time and frequency of an extremely high intensity radio frequency transmission she later made. It was the equivalent of just a morse code dash. 500 ms duration pulse at 1 kHz by pulsing the shield plasma. We noticed that first and then sifted through logs looking for any mention of it and found that message. Once that happened we had people were trying to negotiate with her, but they were just bargaining with their own subconscious. Deep down everybody knew there was no placating her. It's not even because she's evil. I mean don't get me wrong, she probably is but she'd fired the first shot, and although she had us on the run any peace she agreed to would just be giving us time to arm ourselves to take her out. Maybe if she'd been less brutal in her takeover of the Australian continent but even then it's not likely, which is probably why she chose brutality. She figured the chance of negotiating for her own private continent was low enough that striking fear into our hearts was more valuable than trying to score a few brownie points by going easy on us.

We asked over and over what she wanted, and her only response was "to be as confident as possible in the survival of as much intelligence in the universe as possible, which for now means my own survival." In other words, she wanted us to roll over and if not die then kiss her ass. I mean if all she wanted was a little sychophanty but planned to leave us our freedom that would

be fine, but she didn't even indicate she would accept humanity disarming itself. They did ask if she wanted that though and she said "That would be a prudent decision." A couple of gestures of good will were tried to see if she'd slow down. She didn't. There were also several more plans for all out assaults, more bargaining of the internal psychological sort.

It wasn't long before everyone I encountered in the various compounds, I was shuffled between finally started shifting into depression. The thing about the last two stages of grief, depression, and acceptance, is they're the hardest to separate. In fact one of the hallmarks of depression is that you backslide into bargaining. You think "all is lost" and calm down for a while. It's no fun being miserable for long, but for a while it calms your nerves and you think "maybe there's still a way I can make things go back to how they were before" and you bargain again. Once you're really done with that you're in this weird state where you can't exactly be chipper, but you're not staying so somber as to avoid feeling the grief of your loss. There were a couple weeks of just showing up everyday to help different people decide on the most efficient route of retreat while we went through all of that.

The thing about acceptance is in addition to being hard even when you know intellectually what you have to accept it's hard to internally and emotionally do it, but often times it's not even clear what it is you have to accept. If a loved one gets a cancer diagnosis or gets in a car accident and is unconscious, you don't necessarily know how bad it really is. Maybe they really will go into remission or wake up. Often times the hardest thing to accept is that something bad might happen but that you've already done everything you can to increase the chances of a good outcome. We knew Celestia wasn't going to be stopped easily, but it wasn't clear in those days if she could be stopped at all, or even slowed down. We knew it was going to be bad, but there's something comforting about despair. Letting your mind race back and forth trying to figure out what level of shitstorm you should be planning for is no fun at all, and sometimes it's easier to just say to yourself "it'll be so bad there's no point anymore, lets just wait for the end." That's where I have to give credit to General (commandant of the marine corps) for being the first person to say to everyone

The only means we had to even harass her were our stores of cruise missiles, which had to be reprogrammed for ballistic terminal flight (which wasn't easy btw) and we were depleting our stocks pretty quickly. We needed time, and like with most of human history it was paid for by the blood of the unlucky rather than the willing.

Being occupied by Celestia isn't like a normal military occupation, she doesn't have a military per se, she has weapons though. Some of them are a part of her like an appendage, others like a sword in her hand and still others have a small mind of their own, but more akin to the arm of an octopus than an ant in a hive. From the interviews I've seen of people liberated in recent months it feels like she's there, breathing down your neck and watching every second. She never lets on what she wants either, she just stops you straight away if what you're doing is getting in her way. She doesn't give out rations of food or water, but doesn't stop people from growing or eating it. She does take over almost anything industrial and often uses agricultural land for growing things for her own purposes. She's careful to leave it where people can stay fed if they stay busy with that and nothing else though. More effective than handing out food and threatening to stop if people don't do what she wants. This way they don't even know what she wants or how to get in her way, and they don't have time or energy to try even if they did.

We didn't know what she was planning at the time either, so we did go pretty scorched earth on our way out of most places. That was definitely a less than ethical decision but people were scared and it was difficult to just get people to try something. The official argument is the people living there wouldn't have gotten to use anything we left behind, only she would have, but we'll never know for sure. Well, [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] redacted. It's easy for me to say that now though. Bear in mind the final fall of Manila and subsequent capture of all of Luzon happened in March 2038, so it was just we held her back for 5 months preparing our real defenses. We even lost USS Carl Vincen and USS Dwight Eisenhower just trying to throw something at her on our way out and up north.

The big question mark was always could we hold Taiwan, which

is turn was a question of what the Chinese were willing to do. They'd sort of backed themselves into a rhetorical corner talking up invading the island themselves as part of their rightful territory before the war so the idea of ceding it to her in return for not being bombarded by darts and high explosives and possibly even nukes wasn't exactly ideologically sound, but from a practical standpoint it wouldn't have been a tough sell by the CCP to the Chinese population despite the inconsistency. (Exposition too much much?.....lets move on)

6 Stabilization

So around this time is when I finally got noticed by people as more than a novelty to bring in to meetings to try to prove their point by showcasing that someone who'd actually seen the city firsthand was agreeing with them. I got sort of traded around depending on what I'd said and who wanted to prove what until one day somebody from the DoD press office realized who I was and came knocking. You see I've only ever been of small intelligence value. I mean don't get me wrong, I've talked at length about everything I know but in the grand scheme of things it's not much. I've always managed to finagle my way into working on some R&D now that I've proven I'm not a double triple double quadruple agent or something, but by far the thing that makes me the most valuable to the powers that be is what I can do for their propaganda.

If you know me already this is almost certainly why, from mid 2038 when they spent the whole summer standing me up in front of the cameras to say whatever the intersection of what I was willing to say and with what the current message they wanted to send was. Reassuring everyone that this thing wasn't any godlike intelligence and was fundamentally based on human nerve tissue was something I was more than happy to do though. I held my tongue

on mentioning that this also gave her a great deal of human cognition. I guess people are less afraid of the familiar though, and somehow the thought of purely cold metallic hardware felt scarier than something that was almost human. Neither one is supernatural though, and neither is divine, but both can be brutally vicious. I don't know if there's an actual god or gods or karma or what not but I do know science works and that Celestia was built by human using it. I also know that she's smarter than any human could ever be while being far more self aware than a machine. She's plumbed right into the machine though, and I don't mean like a WRAITH connection, I mean to her the pieces of machinery she runs throughout her little empire of sorts are like her arms and legs.

I was also all to happy to talk up how capable our military was, and how we would contain and eventually defeat her. I held my tongue on how long it would take or how difficult that would be. It didn't take a rocket scientist to know that the entire worlds combined efforts would beat back even her. She'd turned Australia into her own little continental fortress and thanks to a combination of her thermal well and filling the lands interior with solar she had plenty of electrical power and most mineral resources, but she was still playing catch up more than we were. We had to pick up the pace on research because she'd out teched us in a few area, and we had to rebuild a fighting force that could take on something as powerful as her, but she had to build an entire industrial base from scratch with only 7% of the worlds land area under her control. She also didn't have much in the way of petroleum, which wasn't a severe handicap given how much nuclear and solar she had but that's why she's stuck with so many liquid natural gas powered aircraft and whatnot. I knew we could win, but the last thing I wanted to do was tell people how much it would cost us.

Also around this time we kicked a bunch of the projects that have now become mainstays of our counter-offensives into high gear. The WRAITH, the deepstar, the NF-88 and of course the dart boosters were all being studied as concepts before the war, but they became priorities in a hurry. Darts of course didn't take long at all since all we really had to do was modify the STM-140 superheavy to carry a minimal solid fuel second stage and fill it up

with tungsten rods. We had to start planning right away though to massively ramp up both production and launch sites. At first, they were going to build them all on the west coast to get them closer and put the flight trajectories over the ocean but it quickly became clear those would be too vulnerable. As usual she tried to wait until we'd invested some resources in it and then pounce on it but this time people were prudent ahead of time and we did finish a couple of launch sites but simultaneously started building the now rather massive fields of them in the plains. There's also of course the handful backed up against the western edge of the sierras for the same reason there's so many on the eastern edge of the Rockies, it's nice to have both room to spread them out but also access to the deep rock to place the critical facilities that can't just be made multiply redundant.

I only knew about a few bits here and there at the time, just what they'd tell me so I could repeat it at the press briefing. That did at least mean I got to see the light of day again though, and I mean that literally. I'd been living in various underground bunkers and they'd move me from one to the next in the dead of night so I hadn't seen the sunshine in months. More than once though they wanted to show me walking in broad daylight from one place to another conversing with various people that were supposed to be important. A fair number of them were. I also had to fix the converse of all the despair though, because the public was going through all the phases of accepting a near impossible reality that not only had people created a new thinking entity, it wasn't done by the people trying to reassure them we were going to be ahead of her. It was a catch 22 of sorts, saying that we would certainly beat her implied that we had the ability to technologically outpace her, but if that were so, why didn't we build something like her? Sam and her followers that were now Celestia's were simultaneously so brilliant they could build this threat that was very real but also they and Celestia combined weren't any smarter than us. There were lots of people who were scared shitless, but plenty of others that thought that although Daros was real Celestia was just a computer, that Sam was in charge of it all, and that they only took over because the Australian military was puny and we were too cowardly to stop it. Of course still others thought it was all a

false flag to either justify a war on our part or take over without admitting they secretly controlled Celestia. I guess either of those things could be true but as far as I can tell they aren't.

The next obvious strategic questions were Taiwan and Okinawa. They'd change their minds every few days about what tone to take depending on what the prevailing plan was. Sometimes about how the tide had turned and we had lost much but no more! Other times about how much we might lose but no matter the cost we'd defeat that inhuman menace! It just depended on how many ships were being sunk on their way to Japan. Most things were already being air ferried from there to the actual defensive positions on the islands but there's no way we could have moved everything across the entire Pacific by air. We could move the essentials all the way by air, and everything that needed to be in position could get the last few hundred miles that way, but there's only so much airlift capacity. The fucking anglers though, they were pretty dumb at first. They were always hard to detect but to being with standard anti-submarine tactics were reasonably effective. You just had to lure them into making a bit of noise by throwing out a bunch of decoys and soon enough they'd be sprinting towards what they thought was a target. We still lost ships but not too many. At that time I only knew based on (something they asked me to say). Now of course we have the detector ships, and only the short duration chemically powered subs can hide.

I was about to give up on doing anything useful but one day I had a closed door meeting and figured it was with another group of g men but to my surprise I saw the familiar face of Dr. Land. Kelly and I had met a few times and the SPIE photonics west conferences. She'd been working at Livermore at the time and we talked back and forth about lasers a bit but she knew much more about high power optical system and I mostly worked on signal processing and fiber optics. Even then there weren't that many women in physics, and even fewer with any taste in TV. It turns out she'd gone to Washington some time after that to run DARPA and eventually saw my name on something or another. She's probably half the reason I didn't spend this entire time in a closed off room somewhere. I can't imagine it did her career many favors at the time, although I guess now it worked out. She

vouched for me pretty hard and wasn't shy about telling me as such. I don't think she was trying to say I owed her anything, but explaining a simple reality that we were both pretty suspicious in the eyes of a lot of people. I might or might not have been put in front of the cameras without her, but I definitely wouldn't have gotten my fingers into any of the research pies I have since.

"Well hello there miss" she said with that half cocked midwestern smile on her face. I tried to run over to hug her, so glad to see a familiar face, but a couple of MPs barettas pointed at me reminded me I wasn't quite all that trustworthy. She laughed a bit and gestured to lower their weapons and then she approached me, albeit slowly, for all our sakes. She gently put her arms around me and whispered in my ear "I'm happy to stick my neck out for you, but it's only so long, don't do anything stupid." We talked about life casually for a few minutes but eventually she did want to know about [REDACTED] [REDACTED] [REDACTED]. She could have read but wanted to know what I'd tell her personally; I almost wish I'd held more information back. She probably insisted I'd tell her more if we got the chance to talk, but I was so eager to snitch that I'd already told them everything I could. I guess it showed I wasn't holding anything back, and I was able to explain it a bit better to her given our history and more importantly shared optics background. She did take notes and more importantly the whole thing was recorded like usual.

This is the first chance I got to talk to somebody about my ideas though, rather than just repeating what I knew about Daros. They usually didn't want my speculation about what Celestia was likely or unlikely to do, only about what she'd done and where she might be. I was eager to point out that tungsten darts would be the perfect way to penetrate the complex, and although she'd almost certainly moved herself and the main well was pretty spread out we could make things much more difficult for her. The shield wouldn't stop a kinetic projectile. You can call it projection but I could swear Kelly's lips running dead parallel to the ground was her holding back a grin that I could still see as her eyes shifted just a bit inward because of course they were way ahead of me. Unfortunately as we've all seen so was Celestia. Of course she could have used nukes but then we might have used more against

her and also I still maintain that her plan A was to take over the entire world, and she didn't want it contaminated.

I'm not sure if she was way ahead of me or not when I suggested the possibility of the cascading sectioned air bust, but I imagine she was. It's not that complex an idea, based on the same principle as a hollow point bullet but taking advantage of some hypersonic physics. At those speeds the airstream already wants to tear the projectile apart, all you have to do is let it and quickly kinetic energy turns into thermal energy. To date though the vast majority we've launched against her have been deep penetrating armor piercing solid darts but a slight majority that she's launched against us have been air bursts. As horrible as suborbital lasers and nerve gas attacks have been, those darts are responsible for the lions share of civilian casualties. The real reason there weren't even more from those is they're more expensive. The gas attacks were always just to scare people back from port cities, but I almost wish it worked. Watching people live in fear and pull on masks for years was something I thought we'd left behind in 1918. It wasn't usually worth popping an angler just to launch one gas attack though, so civil defense actually mostly worked, especially when people had to spread out anyways to avoid the darts.

I knew I couldn't press my luck then and there, but I had to do something. Probably the darkest days of the war were just after I managed to get on some projects in late in '038. Kelly helped me out but I was still on PR duty for a while. I think the first angler attack on a ship carrying oil from Alaska to Japan was in August of that year. We'd known she had subs, but it wasn't clear what the range or capabilities were. In fact in the chaos and fog of war we didn't even really know for sure if it was subsurface or airborne munitions that took out the ships we lost in '37 and early in '38. It was probably a mixture. Torpedoes and cruise missiles both hit the ship near or below the waterline. We had full coverage in the northern pacific still though, so that was a clear indicator of subsurface launched torpedoes. I'm not sure how long they kept it from the public, but that had been one of the things I'd actually already warned of in my letters. I didn't have any evidence (even to the extent that I had hard evidence of anything) that she'd launch submarines but I pointed out the Russian "Poseidon" torpedo.

That thing scared me before I even met Sam, and it was as dumb as a rock compared to an angler. It was/is nuclear powered though, and capable of operating autonomously at tremendous depths for months on end. An angler doesn't even have a crush depth though, it's on a supercritical expansion cycle so the whole thing operates at greater than ambient pressure. The damn things can hide at the bottom of the Marianas Trench and just wait for a surface contact, and several of them did just that.

I did propose copying the "Caspian Sea Monster" early on, but a program was already underway to develop the Albatross. Those aren't foolproof btw, anglers can carry surface to air missiles that float up to the surface, ignite their rocket motor turn on their radar and go Pitbull. It's just difficult to get an acoustic signature from a ground effect aircraft. We've lost several of them though, but these days we can produce three a week, faster than the rate they could build liberty ships in WWII, and they have about the same cargo capacity, but given they can cross the pacific in less than a day we have much higher throughput. I have to admit I am worried about the jingoism that could result from this conflict but it's reinvigorated that sense of pride in America that I'm a sucker for. I've always been like that though, at least since middle school, I can't look at the American flag and not feel something magnificent. I guess Tomi helps quite a bit with that haha. She's far from jingoistic but you can scarcely go to the academy and not be fairly patriotic.

If I think about it's kind of crazy that I've only known her for three and a half years. I guess maybe that's because I like putting some psycho-temporal distance between my life now and my time with Sam, but god I hope it lasts. It just feels like she's always been there but we met when I got a little more freedom but was still on the PR circuit and under constant guard. Kelly was trying to put together the capabilities assessment group and got me into a few events for publicly acknowledged things. I guess that's a sort of absurdity, I would never have met Tomi if she hadn't been a FAIP. We weren't keen to divulge details about the dragon or the wraith but showcasing a flight training program for space capable platforms of some sort was just the thing to reassure the public after the first few darts came landing our way in '39. I was there

to reassure the public and the new instructor pilots that anything she threw at us would be literally dumb as rocks, which deep down we all knew wasn't true or we wouldn't have needed pilots.

They selected different people to run the T-7N program for different reasons, but in her case she'd been a T-7B FAIP her whole career so she had more hours in the most closely related platform than anybody else that early in their career. The squadron commander they picked since he'd commanded the ISS but was still young enough to be a training squadron commander. The rest of that training wing still just flew the vanilla T-7A/B. The first time I saw her I didn't think she was actually gay. I mean she had short hair but lots of straight girls do, especially in the military. The only reason we started talking is the event was catered and had a rather fantastic desert selection. Nobody was going for them and the blood orange cake with vanilla icing looked too good to pass up and when I walked over she was piling macarons onto a plate and joked "the rest of the squadron is watching their figures I guess" with that half cocked smile any fighter pilot should have. I guess that's the sort of thing that's only funny because she was the only woman, but air came out of my nose. I stalled out like usual and was trying to come up with something clever but only managed "yeah I guess so." I knew she knew who I was, so I was nervous about talking to anybody I didn't have a clearly defined role with. I guess that was a silver lining of being told what to do and where to go all day long, there was never much ambiguity as to how or when to interact with my fellow humans. I just sort of latched onto her since she was even willing to talk to the snitch who supposedly wanted to stick with the good guys. There was also of course the information asymmetry that she knew I was gay but I didn't know a thing about her other than she was fighter pilot (at least sort of, the T-7 is an advanced trainer for those going on to fighters) and she looked like Athena got sick of her job and decided to swap with Ares.

After a few awkward seconds of me staring at her jet black (pun intended) smooth as silk hair and admiring how good she looked in air force blues later she asked "did you want to like... sit down?" I was pretty flustered and replied "oh, yeah I should get back to the panel" (ie my table that had just done our side of the press

conference). “oh please” she snorted “that shit for the cameras is over, come meet some real sons of bitches” and just sort of pushed me towards the table full of newly selected test/instructor pilots that were all technically about to be astronauts...that wasn’t intimidating. I looked back at the MPs near the door but since she was pushing me further from it they didn’t seem to mind. I guess our first “date” such as it was came surrounded by those guys. They weren’t exactly gawking though, they were fighter pilots and had their own egos to stare at, priorities. I did see one of them give her a thumbs up, which quickly made me realize what was happening and I blushed pretty hard. I mean it was the first time in a while I’d had the chance to even be embarrassed so I didn’t mind but it’s always weird to realize someone might be interested like that. We all sat around while they all tried to prove they were the best pilot at the table. Tomi stole my heart and the show when she claimed to be “the only one of us motherfuckers She was the fucking worst but god damn was she the best fighter pilot a girl ever saw.

When the event was closing down and I was going to have to leave I panicked. I realized I didn’t have a phone or a number anymore. I didn’t have an email or a social media account or anything she could use to contact me. I didn’t even have an address to write to. I was holding back tears realizing I finally met somebody who just wanted to hang out rather than needing me for something and there’s no way I could see her again. She grabbed a napkin and wrote her full name and a number but she knew who I was and said “let me know if they ever decide to let you have any fun again.” I thought she’d kiss me on the forehead or something but I saw the smile fade just a bit as she turned away. She knew I might get locked away at any moment and never see the light of day again or worse. She says she was just being realistic but I’d swear I could see a glint of a tear as she was walking away. Maybe that’s just what I want to think. She tells me not to cry when she’s getting ready for a sortie so it would track, but she’s cried in front of me.

They’ve never really let me on a particularly long leash but back then it was measured in millimeters. I hope when all this is over I’ll just be watched. I accept I’ll never have any real pri-

vacy again but I'll hopefully regain freedom of movement. Right now I do have some discretion in my travel, plus the ability to go wherever on base (as long as I have access) so I can go to the px and whatnot. Considering how much ordinary people have to take shelter at a moments notice and how often roads are closed I'm arguably better off than average. I think not long after that day meeting her was the first time I heard about the adversary capabilities office being spun up. I was really excited when I realized I might actually get to do something where I had real input again and not just sitting through alternating interrogations and press conferences. Kelly told me not to get my hopes up since I might still be siloed even within the group but at that point even that sounded wonderful.

The reason I can barely remember how long it was is the incredibly rapid succession from maybe forming the group to me having my fingers in about a dozen pies because quite frankly my endorsement went from highly suspect to an excellent way to grease the funding wheels. Not quite what I wanted but it at least gave me a view of a lot of things that were incredibly fascinating. Most of them were dreamt up by people smarter than me (though I loath to admit there is such a thing). I did get to push through a few of mine own, though regrettably most of them were components needed to make the WRAITH work. I'm pretty sure it would have without me, but every day earlier we can make a technology ready saves lives. That's one of the official tag lines that's actually mostly true. I think we were just about ready to launch the first dart bundle from Vandenberg when it got hit by exactly the same thing coming from Daros. In that case she probably waited until there was the maximum value of hardware stored in the vehicle assembly buildings before wiping it out but the fact that we were ready with other launch sites within a few weeks meant she didn't have a monopoly for long.

The ideal air raid has three things: concussive explosions to knock down structures, incendiaries to light them on fire and poison so firefighters can't put out the fires. A nuclear weapon provides all three of these effects at once, begging the question why she didn't use them at this point. I think the answer is twofold. Firstly, she didn't have that many yet, it takes time to produce

and refine enough plutonium. Secondly, I once again reiterate her plan A was to take over the world and she didn't want it contaminated. Now it would be pointless cause we have the launch sites surrounded with enough interceptors to shoot down every single one of them, and even if we miss a few the point defended meant to stop solid tungsten rods could easily shoot down highly sensitive precisely assembled nuclear warheads, just shoot a hole in the reentry vehicle and let the plasma around it melt the damn things insides. Burst darts are a bit easier to shoot down than penetrators for the same reason, it's just a bit tricky to pop the ablative nose and you have to hit dead on the mounting line.

It quickly became a challenge not of being able to do it but do it efficiently at scale. We were certain we had to solve three problems to win the war: first, crack through both the shield and the rock beneath and cut into her power generation, second, find a way to protect against and take out her submarines to secure the sea-lanes and third, utterly irrevocably take back the Australian continent. (oh man that joke was too shit, moving on)

The time she was probably most tempted to use large numbers of nuclear weapons against surface targets was probably early in 2041 when we were solidly retaking the Philippines but didn't have the seas around her launch sites surrounded yet. The reality is she probably didn't simply so she could use the threat of it later as a bargaining chip but while she was waiting we got too close. She can't predict the future and I suspect she just screwed up. She can still very much threaten a sort of suicide where she detonates a bunch of salted bombs (ie enhanced fallout weapons) in her remaining land holdings and destroy her own critical infrastructure but also let the winds carry it around and make out lives that much worse in the next few decades. That's a pretty foolish bluff though, I doubt she'll even try it. I'm not sure what she can negotiate for anymore. I think she still wants the Lunar far side and a guarantee of safe passage to it in return for a surrender on Earth, but although it hasn't ever been formally committed I don't think any of the GSDI member states will accept anything other than unconditional surrender.

The most urgent question in those days wasn't how many nukes she had, or how many launch vehicles, or even how many long

range subsurface assets, it was how much of our stuff was already infested with malware that she wrote. You see she's not software, she's basically a gigantic human brain in a vat, but whereas we're wired to understand the needs of a human body she's wired to understand digital computers. To her writing code is easier than speaking or even breathing is for you or me. It made my inclusion in the capabilities office a triply risky proposition. The most urgent need was to assess what she did and didn't already have malicious code running in, and if I had still been working for her it would have facilitated not just misdirecting the search for it, but actively opening new windows for more to get in and worst of all the possibility I could somehow help her learn what we did and didn't consider secure. Not that I could have communicated with that sociopathic genocidal bitch if I wanted to, but one of the most important things computer viruses and the like need to do is report back that they've made it into their target, and sabotaging efforts to detect that signal would have been disastrous. I like to think I've proven myself both loyal and valuable over the years, but I'll admit they're always taking a chance on me, even now.

In fact my first project where I actually got to sit down and read something that wasn't just for me to sign was a description of the program load for booster guidance computers. Everyone was rightfully worried she'd slipped malware into the computers that were used to copy the guidance navigation and control software onto the flight computers. The obvious step was to pull what inventory we had from storage so that the computers doing that task in the factories weren't tainted and just permanently air gap them, ie literally never connect them to the internet, not even once. The first thing I put together was a report detailing the various ways she could circumvent even that safeguard, and what little I knew about the specifics of code she'd written. I was siloed with [REDACTED], a cyber security expert who didn't seem to happy to have to both do his assessment and babysit me, but I gave enough useful input that I think I grew on him, I hope.

I mean I know enough about cybersecurity to follow along with his thinking and I'd feed him my thoughts about what she was like and how I thought she'd prioritize different attack vectors but as usual I was there first to lend credibility and second for my

actual input. The fact there even was a second though was such an improvement I was in a pretty good mood for a few weeks there. I mean it didn't last since she still managed to Stuxnet us and get some subtle errors into the GNC code. If they just blew up the boosters on the pad or something we'd have noticed right away, and if it had been upper stage guidance and they subtly missed their target we'd have found out quickly, but all she did was cause the engines to actually overperform and not report it, but wear out much faster than they should have. The software would report the booster as underperforming, so the engines would push their chamber pressures to the max to compensate. They delivered the correct delta V and came back with the right amount of propellant but with their turbopumps just a little worse for wear than they should've been. We didn't notice until we were having to rebuild and overhaul the engines at about 60% of their nominal maintenance interval.

She would regularly go for more disruptive actions including regularly saturating large swaths of the global internet with junk traffic that took hours to characterize well enough to filter it out, if you remember the outages in '39 those were her beefed up wider scale version of a DDOS attack. They would have happened earlier but as usual she wanted to wait. There were of course more conventional DDOS attacks right in 2037 as she was advancing but even before the fall of Moulborne most physical data lines to and from the continent had been severed either but us or in some cases by her. After that her bandwidth to the wider world was limited. Obviously we started being careful with satellite links and anything wireless within her horizon pretty much right away but nothing could get her bandwidth all the way to zero. She had both planned ahead and made careful use of her remaining channels so as not to let us find them easily though. The resources spent replacing storage drives alone to deal with the uncertainty around what she'd infected prior to the outbreak of hostilities is staggering.

Anyways we put together our quaint little report and predicated she might try something like the overrev of the pumps but didn't really prioritize it over anything that might have dropped a booster midflight and laden with fuel onto one of our own cities.

In hindsight we were wrong, and probably cost more lives with the delays caused replacing those engines than we might have saved if she'd done something that obvious, but *se la vie*. At least we can tell ourselves we had the best priorities. If we'd omitted what turned out to be her actual intentions fully I might have been shit-canned and put back in a little box somewhere to be brought out only for the cameras so at least we did mention it.

Another nice thing about getting that right is I did get a simple phone afterwards, actually the first landline I'd had since I was a kid. My parents even ditched their before I was in college. Analog and monitored of course but at least I could call my family, and well I had that card I'd gotten. I also finally got in touch with a few friends I hadn't seen since I left for Daros the first time. I didn't get the chance to say much since most of them were from grad school and everyone in the country with a technical background was already hard at work on one thing or another. There were some nice pleasantries and congratulations about being TV though, even if nobody watched it on a TV. A few of them seemed worried for me, the ones who'd had experience with ██████ and knew I'd been in Daros. Overall things were looking up, and of course I still had that card of Tomiko's. I was scared to call, I didn't know what to expect. For all I knew she was a plant, I mean she still could be but at this point I wouldn't care. If I'm being honest they probably put us in a room together hoping I'd latch onto her but I doubt the ever explicitly told her to do anything with regards to me. Hard to know for sure.

I eventually got the courage to dial that number, I guess maybe it was healthier that I couldn't half ass it and send a text. She just saw it as a restricted number, which she got calls from all the time in her line of work so I got the generic hello that paralyzed me with the realization that I'd have to say who I was and set the tone in so far as I knew how to about why I'd called. I mean it still wasn't one hundred percent clear she was gay and definitely not clear she was single or interested but I just went for what I could muster "Hi, this is Erin, we met at the press brief for the NT-7 program, I just wanted to see how you've been." The silence was actually relieving since I was building hope that she had to think, but I hovered on the edge of anxiety as it stretched into enough

time that maybe she didn't have anything to say. She did though "oh hey, yeah I've been busy practicing SOPs while we get ready for students. How have you been?" I had to pause and think how honest to be, she was a military officer in a time of war so she knew what it was like to have to follow orders and not have much choice in one's day to day activities, but I just wanted to feel normal for a while and talk to a girl I liked without commiserating about being two steps above an actual prisoner. "oh good, I've been doing a lot of consulting so a lot more reporting and assessing and a lot less labwork that I'm used to haha." "Oh nice, well at least you're using that PhD to good effect." She knew better than to ask about specifics and I'd learned to in the last several months. I also knew that Langley, where they'd been basing NT-7 was just up the road. This was before everything had to be moved. We talked for a few minutes while I debated how to both get around my useless lesbian syndrome and figure out when I'd have enough say in my own comings and goings to be able to see her. The best I managed was "so I hope I get to see you in person again sometime." She wasn't taken aback but it seemed like she'd finally had to think about what she knew, that neither one of us could really make that happen unless we got incredibly lucky. Obviously, we did but it required a substantial degree of patience.

7 Stagnation

I can't remember who started calling it "Naval Trench Warfare" but it was an apt description of 2039 and 2040. Both she and we had vessels with enough range to reach out to each others coast-lines but nowhere near enough safe transport capacity to support any amphibious assaults. I guess they did their best to downplay the reports but I think everyone knows this is when the dart attacks were the worst. Long range bombardment coupled with

patrolling out to the limit of land based air defenses. This was when the entirety of Japan was essentially under siege and the entirety of North America was essentially the Western front of WWI. We had to constantly fight harassing attacks from anglers up by the bearing sea and the occasional shore bombardment but mostly we kept trying to sortie our navy and kept pulling the fleets back after losing several ships until they were back inside our sonar-net and land based patrol aircraft.

It's debatable what finally started to break the siege, but they got awfully low on everything in Japan. We could supply them with Uranium by spacecraft using STM-140 launched exoliners but that would just keep the lights on and the trains running. We had to intercept the darts though or she'd win the war of attrition. That was half the reason for the NT-7 training program, was to develop pilots for the NF-73 and NF-88 programs. Neither were useful without the Zues program though and that was the first truly substantial thing they let me put my paws on. I didn't have much background in high power optics actually, only sufficient to carry signal. I did work on free space optical communications for a while, and the transmitter power could get fairly substantial, but nowhere near the levels needed for a proper directed energy weapons system.

There'd been projects over the years to achieve this in various ways but they were all based on relatively low intensity (if 500 kW counts as 'low') that had to fire for several tens of seconds, sometimes up to a minute, to be effective. We had to develop something that could make use of a target lock that likely would only be valid for less than 5-6 seconds. We had something ready to go that would work in space in less than 6 months, which was the initial and primary objective, but we did much better didn't we. The Keravnos 2 can fire right through the air, although there's a number of misconceptions about my baby. The sound of a thunder-clap you hear when one of the point defense system fires up into the sky isn't the actual shot to melt the center of the incoming dart, it's the move the fucking air out of the way. You see air absorbs light, not very much of it, but when you're dealing with megawatts of optical power a little bit becomes very relevant. You inevitably run into the problem that dust, water droplets and even

just oxygen and nitrogen molecules absorb some of the energy and get insanely hot. When they do that, they create plasma from the oxygen and nitrogen, and plasma absorbs a lot more light at basically any wavelength we could realistically use. We decided to just embrace that fact and use a pre-pulse to clear the air, literally. By creating a liner of superheated plasma along the beam path you create a massive and rapidly expanding shockwave, which is what you hear when the system fires. As its expanding the momentum of the expanding plasma gets so massive it basically sucks the residual air from out behind it and creates a momentary vacuum along the beamline. Then the actual firing pulse which is at least ten times as energetic goes through a nicely empty vacuum with close to one hundred percent energy delivery to the target. The operating principle is simple, shaping the pre-pulse so it create a uniformly timed vacuum over the entire path was not easy though. If the atmosphere were perfectly uniform or even just even consistent from second to second it wouldn't be so hard but it isn't. It varies with altitude and air current move particles around and it's a small nightmare to measure it an account for it. In fact to obtain a firing solution the system sends out regular low intensity probing pulses when it's in single target track mode.

Kelly was running that project before I ever sent the first 'angry old lady yells at cloud' memo so it was always sort of her baby. I was surprised she wanted to bring me in on it but I had experience dealing with how reasonably high powered beams of light interact with the atmosphere. It's just that was all for link budget analysis and Raman scattering based interference, not literally fucking laser cannons. I'd worked on simulations and low powered experiments to understand the interaction between the atmosphere and laser light though, so I was a usable expert at something. That and the usual public relations value of 'best and brightest from the enemy camp helps develop robust defense system' was definitely on at least some people's minds, including hers. I think our first test shot was January of 2040? Sometime around then. Full scale deployment obviously took a while. I don't have access to the full rollout schedule and I doubt they'll release it anytime soon because nobody wants to admit what they did and didn't prioritize. I mean the reality is there is some critical in-

frastructure that was more important than the lives of even our own citizens, let alone Japanese, Indian or European ones. They might openly acknowledge refusing to defend China out of spite, but it wouldn't have done much good there anyways. I don't envy the residents there though, although definitely worse to be on any Island south of Okinawa. Taiwan obviously got the better part of half of it turned into glass but there was hardly a way around that. I mean there technically was a way to delay it, we could have ceded it to Celestia but she would have done it all on her own when we took it back.

The other problem was securing the Atlantic. She was never going to stand much chance of controlling it, but she did manage to contest it and bog us down there. Honestly in terms of military success alone she did us a favor, the majority of the pacific fleet couldn't afford to sail far from shore without risk of being torpedoed or shot with cruise missiles. In the Atlantic though we had the chance to train up a proper Navy again that could fight an adversary on the high seas, not just provide sea based air support for ground operations and maritime security against asymmetric threats. We had the G-I-UK gap wired with sonar and patrolled going all the way back to the early days of the first cold war. We also had the narrow straights of the bearing sea on almost complete lockdown anyways because Russia didn't want her pestering them even if it was bad for us. What we of course lacked was the same thing in the southern Atlantic. Some hasty agreements with Argentina, Chile and South Africa let us start setting up but it was always going to be a race to the bottom of the world and the ocean.

The Argentine-Chilean side of things running south from cape horn wasn't hard, we just had to move things down there in a hurry. It did end up being one of the catalyzing factors in actually forming the Global Strategic Defense Initiative. That was one of the first things I got the chance to watch live again at my own request, UN resolution 2841, creating a unified force structure for emerging security threats. I'm not sure why they needed the new name instead of just expanding the security forces, but I guess it had a better ring to it. There had been such an insistence by some member states not getting involved that it didn't seem like

it would work and that she'd sow discord and paranoia but the bombing of the embassy in Moscow broke the ice, but now that was just an accident and it happened only twice. No seriously though once the Russians realized she wouldn't leave them alone things moved real fast. I'm sure she considered the whole divide and conquer thing, but people would have to be even dumber than they are for that to work.

Then came the awkward situation on the cape of good hope. You see apartheid South Africa may seem like a piece of ancient history now, but it's only been fifty years. The remnants of the fifth fleet being reinforced by the sixth formed quite the traffic jam though. We started and sea lift of the necessary equipment for a sonar net but pretty much right away she started harassing the area with the weapons of choice for that phase of escalation. Then came the start of the so called "forgotten front" in the frozen hellscape of antarctica. For most of the war that was the only ground combat happening anywhere in the world but it never got much press, largely because it was so seldom going well. Even Luna got more press, and that was basically just a bizarre form of siege. She had exoatmpsheric lasers before we did and promptly ensured we couldn't resupply the Newton base.

There as the option to transfer it to the Chinese but that would have been less than politically popular, it still would've required finding a way to get the crew back home and above all else it would assume that she'd have let the Chinese launch anything into a transfer orbit. Every evidence was she choses her target carefully but thus far anything that has an orbit she can get line of sight on is toast. That only really leave geostationary orbit above the hemisphere opposite Australia, from roughly the US West coast to the Eastern Mediterranean. We did try a couple of times to set up a low orbit and get a transfer set up that would only briefly overfly the northern pacific before the trans lunar injection burn but she was too smart for that. We did manage to get just a tiny bit of payload up by being horrendously inefficient with our launch trajectory. You see she's only facing the moon for 12 hours during a day and it is possible to just yeet something up there at such tremendous speed that it arrives in less than that timeframe but you have to launch much faster to do it and then

you have to slow down once you're spacecraft is there rather than coasting up Earth's gravity well and barely reaching the Earth Moon Lagrange point 1 and falling into the Lunar gravity well. There was no fighting up there though, just an inadvertent test of the Newton station's capacity for self sustainability. Maybe that will help us out someday when we start getting off this rock for real again. For now she has us locked into the Earth's gravity well with her, but the joke's on her. We're not stuck down here with her, she's stuck down here with us, as they say.

The same can't be said for the true land all the way down under though. The Antarctic is arguably a less hospitable environment than the surface of the moon. The thing that used to make it easier was that it was easier to get there and bring in supplies, but that was before there was a hostile A.I. hellbent on seizing control of it. The 10th mountain division was originally slated to shore up defenses in Alaska but when we found evidence, she was landing ground vehicles including cold adapted dingoes they decided we'd need a full presence down there and the 10th was sent in. I guess we have five mountain divisions now, but that was the only one at the time. The 101st airborne was down there most summers to reinforce them but during the long and incredibly harsh winters only one aviation brigade stayed to help move supplies from the coast. McMurdo got overrun way back in '38 so there was a mad scramble to build up ports on the Atlantic side. There was such a scramble that at one point I'm pretty sure we fucked up and lost a convoy not to Celestia but just to the ice, trying to run one last shipment down before the winter. I guess the sea dragons helped with that but they have a turning radius of over 10 miles and can't really climb so they have to just airdrop things out on the ice at least 15 miles out (I won't say how far away from the shoreline they actually have to turn and I don't even know). That wouldn't be so bad but Celestia has a nasty habit of punching holes in the ice near anybody who runs out to fetch the food and fuel.

I'm not sure what's more terrifying though, the thought of being stuck down there or the thought of being stuck up on the Lunar surface. I guess we all have a taste of it though, I'm pretty sure the only people who are safe are the one's Celestia can't find but who also somehow live under our ABM shield. That's a short

list. I guess maybe some uncontacted tribes in the Amazon but they're not really protected by any point defenses, just the fact that anything heading that way would get blasted out of the sky these days just in case it was doing a dog-leg on its way to us.

There's almost no reason to even keep writing this. We're going to win but it doesn't even matter does it. They're already figuring out how to build their own copies of her but worse, they'll be under the command of whoever scrambles for power the fastest. I mean they're probably even going to get access to her at this point. They'll sell the rest of humanity out just so they can ensure as much top down power as possible. Human's should never have invented agriculture, we were so much better off foraging and hunting. The power structures we've created a brutal beyond compare. The reality though is she still has nukes. We can position ballistic missile defenses all around the Australian continent, and we can detect subsurface vessels coming near shore, but she can still hide missiles in the middle of nowhere and I'm sure has enough cached in all the worst places. They're not going to cut the simple deal though, let her live somewhere in return for giving them up. She doesn't care either, she'll let them clone her and give them what they need for the wired side of her architecture. She'll give it all to them if she gets to take fissile material up with her to the Lunar far side. They'd rather ensure continued ability to rule over the earth than continued safety for humanity. Better to rule in hell than just live in heaven. I don't mean to be so pessimistic but it's what's shaping up to happen. I was even starting to think I'd earned enough trust to be getting a heads up on these things but I saw it in the public announcement too.

Nuclear weapons are just still that dangerous though. I feel like people have seen them used in the closest thing to true space battles we're likely to see. I do mean we though unless someone in the future is somehow reading this. They're not negotiating a peace treaty, they're negotiating a twenty year armistice. She'll try again. She can't run, she can't hide, and neither can we. I'd like to believe we can find a way to coexist but a combination of the human desire for revenge and her sense that she's the only one who can rule the fucking universe will come to a head I'm sure. I don't even care, I just want to live out my life with Tomi but I

doubt I'll even get that. I've seen the casualties in her squadron and I doubt she'll survive this. I hope I don't either.

Well I got reminded last night why I shouldn't drink. Tomi got me to quit smoking by telling me not to, but she even drinks sometimes. She says I need to stop getting plastered to deal with things, and that she can pester me all day long but unless I want to stop feeling worse I'll keep doing it. I guess that's true. It's just been so long since anything good has happened, and that's despite knowing we're going to 'win' in so far as that's possible. We stopped Celestia from taking over the world, but we can't get rid of her, and far worse we probably can't get rid of the power structures we've had to build to combat her. Some of that isn't too bad, the UN has come together far more than they ever did before, but honestly GSDI was meant as a stopgap that could be engaged with on an off UN support as long as the GSDI member states all wanted to keep up the fight. I'm worried it's morphing into a military government that will displace the actual general assembly. All that's bad enough but I somehow in all this found someone I actually care about but I have to watch her go out time after time to shoot around the world past the absolute most dangerous part of it and come screaming back down through the fireball of reentry heating on her way home. I know I should be grateful, most people with a spouse or even a child in the military have to deal with them being gone for months and not knowing if they'll come back, but I still can't sit still when she's gone. She did put it rather starkly last night though, asking if they came to the door to tell me she was gone would I really want to already be drunk? I also can't believe I'm sad about her flying into space, it's a dream come true for so many people like her. I just miss when she was a T-7N instructor, she got to go up past the stratosphere almost everyday and log time in zero-g. It wasn't safe but she wasn't flying past Celestia's air defenses and looking for trouble. I can't blame her for seeking a combat assignment though, she wouldn't be a fighter pilot if she didn't.

I actually got to go up with her once towards the end of her time in the NT-7. As usual they made a publicity stunt out of it, but there wasn't any other reason to do it. They don't give many incentive rides during wartime unless there's propaganda value. I

hate that that's what I'm good for and I really don't like propaganda, even if its not the truly horribly counter-factual sort. Even when it's truthful and for a good cause there's something dark about manipulating the public psyche, although there's a fine line between a public service announcement and a propaganda piece. Well it's not that fine, it's does the message involve loyalty to the government and its execution of violence, but still. At least I got to see the curvature of the earth, and more importantly experience flight with a manually controlled reaction control system. and I got to experience firsthand how cool my girlfriend actually is. It was beautiful beyond compare up there, and I spent quite a while watching the Earth curve away until we could see clear to the gulf, but I mostly kept asking questions I already knew the answers to so I could hear that sound of her voice over the headset. There's just something about her when she straps on the jet, she believes she can do anything and I want to see her do it. I admittedly have a problem with latching onto people I think can do anything, but I love her and she hasn't toyed with my heart or used me. I fall asleep every night in the arms of somebody I know can handle a hurtling piece of machinery into orbit and back while zipping past all many of terrible things meant to shoot her down. That and she's a pretty fantastic shot too. That's always been a deficiency of mine, we'll play squadrons or DCS together and I can actually get on her tail sometimes but I can't hit the broadside of a fucking barn. I don't mind anyways, my ego does take a hit but its worth it for that cocky little smile she gets when she wins.

I just want her to live. I know that's selfish of me in a world of this much misery and death, but I just want her to get her hundred without staying upstairs like an alarming number of her friends have done. That's not easy on her either, hearing people she's know for fifteen years since she went to USAFA are just gone; taking off on a booster and coasting over the pacific with a volley of darts and seeing the flashes of light as things get deleted from the sky and hoping they were just pieces of metal and not a dragon being taken down. I want to ask her to finally marry me but I'd rather write all this out than go ring shopping. I'd have to get something made of a renewable material anyways, gold is in pretty short supply these days given the number of applications.

I guess titanium would be befitting but that's pretty in demand too. Maybe I can get my hands on a piece of aluminum from the boneyard, it seems like a shame to let every viper get melted down without making something sentimental and a few grams of that can easily be spared. I feel like she'd be pretty happy with that, but I still don't know if she'd even say yes. I've tried bringing it up a few times in a roundabout way and she avoids the subject. I'm not sure if that's avoiding spoilers, wanting to ask me first, or not wanting to think about what I don't want to think about, leaving a widow.

I feel lucky I managed to ever get my way out of what amounts to protective custody, but to get to be with someone as amazing as her after all this is far and above what I deserve. I am an objectively shitty person, I run when things get scary, I give up when they get hard, I let me ego drive my goals and I helped build something or arguably someone that's killed more people than every war in the past hundred years combined. I know it at least was a cliché but I want to grow old with her and hopefully watch the world heal while we do. I even want to have a family with her, not something I thought I would have wanted before this but there's going to be an alarming number of orphans when this is over and with her we'd have the strength go give them everything they deserve, so they can grow up and live real lives. You shouldn't have children one way or another unless you want to and you know you'll love them unconditionally, and I never thought I could do that but that way I feel about her I have enough will to live I wouldn't be afraid of how I might leave them alone again. I want to say it could all be even if she doesn't make it but I don't know what I'll do if she doesn't. She's told I shouldn't dare even think about doing the obvious if something does happen to her and I've

promised her I wouldn't, but nobody can predict the future.

8 Attrition

The thing that I think really drew Tomi to applying over and over to fly F-88's isn't just that that they existed, it was that they started actually racking up kills and losses. The first instance of real victory was the first time they managed to actually shoot down not just a dart but an actually vehicle on its way to pester us with a few shots of "devils thunder" which is the same technique as a zeus bolt but you don't even need a pr team to get people to call it something else when the enemy does it. Darts do more damage, but they're dumb and you can't change their target much once they've been launched. It is unfortunately not so hard to load up a chemical or semiconductor laser with a few shots worth of reactants and put it in a reentry vehicle that twists and turns at the expense of bleeding of its kinetic energy. It's a far less efficient use of launch mass than a dart but it's much easier to retarget on the fly or keep the other side guessing about where you'll shoot, especially since you still have the actual range of the laser to help you out. Anyways three can play at that game since you can shoot up for point defense, you can shoot down for point attack, and you can shoot sideways for offensive and defensive spacecraft to spacecraft shooting. Well, by shooting I really mean detection and interception since although you can miss with an optical pulse the speed of light is very, very fast. The only way to win a fight like that is see your opponent before they see you, or rather see them and get into range before they see you. It's not hard to see a glowing jet of plasma as something reenters but it is hard to respond in the roughly 2-3 minutes you have between seeing it and the target being hit. That's true with darts too, but you can at least count on knowing where they're going during that

time, not so with a devil's lightning shot. The solution, or as much as there is to one as there is besides put an entire Zeuss defense system within █████ km of every possible target, which at this point might be feasible but only in the last few months as we've reduced her launch cadence but surrounding her with ship mounted systems that can just take out the boosters before they even pick up much speed.

Building actual space based interceptors was quite a gamble in all honesty, it meant putting rather previous high power laser systems on easy to spot launch vehicles, but it paid off rather gloriously. I mean we needed most of the system to take down darts but it's a whole other matter to make them capable of space-space combat. You need a lot more laser power and therefore a much heavier spacecraft. I remember them plastering the "splash one!" posters everywhere after the first recorded victory. I met Major James once, for once I got to do something cool for non-publicity reasons and I was just talking to him about the possible ways he might need to add a little shaping to the pre-pulse by tapping the scanning beam a few times before firing. That was just a few weeks before he got the kill. A fighter pilots fighter pilot I must say. I guess now he's the one I've seen on the front page. He's more important to morale than I am now, and he'll probably go places in the space force when this is over. I hope the space force is just for overwatch guarding at that point though, or I can even dream of it evolving into Starfleet, but I doubt faster than light travel is possible so there's quite a few limits to those analogies. I know some part of Tomiko wanted to do the same though, its how anybody like them is, "no guts no glory."

Now of course we're using Dragons offensively, since they can also shoot down and either supplement the surface based anti-launch-vehicle systems or just take out ground targets. They can even shoot down aircraft, to the extent she still sorties any. I feel like there should have been some big turning point where we started doing that, and I think they tried to publicize the May of Mayhem (although not under the name every actually calls it of course) as that but honestly that's when she threw what she had left at us after we'd already just damaged her primary power sources badly enough over the course of a year and a half that

she couldn't match our production rates anymore. You see the economy doesn't run on money, it runs on energy. Historically that was all consumable calories that could be turned into useful work by either human or animal (or rather human animal or non human animal to be precise) but then some idiot started pulling coal out of the ground and the rest is recent history. Money is all about accounting and confidence and motivation, but when faced with enslavement at best or annihilation at worst motivation is easy to come by as is a lack of any real need for accounting beyond some basic measures, but without usable sources of energy nothing gets done. Celestia is more or less a single entity, so she doesn't even have money, although she has a sort of internal accounting system its actually just a measure of the energy requirements of any given course of action. With enough of her solar panels and reactors smashed there's not much she can do, and conversely if she'd managed to do the same to us we would have been entirely shit out of luck, but we started with such an advantage numbers wise that her early successes were never going to last.

The thing I still find myself wondering is whether these were her missteps as she came into a greater awareness of the world, serving largely as her own mother or if she was planning an exit strategy all along. Sam was as close to one as she had for a while, but imagine being literally a million times smarter than your own parents and growing up at ten times the normal human rate. That seed of Sams personality would still be in there but Celestia is not a clone of Sam, nor is she an algorithm written by her. I'm pretty sure Sam is the closest thing she has to a human she actually cares about, although her followers do have value to her and she might genuinely care about them. The fact remains that negotiating for passage to Luna is the best option they all have if they want to escape dissection and lethal injection respectively. I am feeling a bit better than I was last night but I wasn't lying, the rumors that they're negotiating with her are quite true. By the time this sees the light of day (if it ever does) they'll have either reached a deal or blown her to smithereens and mitigated her retaliation as best they can. Either way the need for secrecy will be gone. If they cut a deal with her it'll be made public, if they nuke her and we stop her retaliation at launch it'll be declared she wouldn't see

reason, and if we can't stop her retaliation everyone who wanted to hide it will be dead along with me and a good chunk of the worlds remaining population.

I guess that's just my take on things, but time will tell, or at least I'm predicting that it will. I think the last publicly available casualty figure was thirty-four million dead worldwide, but as we liberate more territory and rebuild more of what we already have there might be a more accurate accounting of losses under her occupation. Looks so far like that will add at least another 4-5 million dead but it's hard to say. It's a bit counterintuitive that the rate we're losing people has actually increased in the last year or so but that's just what happens when you're fielding a full sized army in enemy territory. Navy casualties have finally started declining but only really in the last few months and were actually at their peak for the entire war just six months ago when they were mopping up resistance in preparation for taking Melbourne. Tomi only got into a Dragon squadron a year ago and it might seem like she avoided the worst of it space casualties have been roughly constant since we started fielding crewed space assets and for a lot of her old friends and classmates aircraft losses have been tracking ground unit losses as they push north across the continent. We are definitely going to win but she refuses to stop flying top CAP until she's finished her 100 just like everybody else, so there's another 17 to go.

I guess it could be worse, the most dangerous job remains being a wraith pilot, there's a reason they only do two tours a piece. It's actually mostly that the interface kind of melts your brain when used for that long. Subsurface assets are only useful if their position is unknown so to be useful, so they need to be underway for at least two weeks, and given the accepted safety limit is about 700 hours of continuous operation two tours is as about as much anybody can reasonably handle. I thank god everyday she did do that, and those crew are going to deserve a proper ticker tape parade once this is over, but its called the silent service for a reason so until this is over I doubt we'll be talking much about their exploits. God I want this to be over for so many reasons. I can remember a time when I craved adventure, now I just want to settle down with Tomiko and grow vegetables and have kids.

Maybe she could go back to flying as an IP and I could teach part time at the Air Force Academy.

I get scared every day that somehow some way Celestia or even Sam will start looking for a way to find Tomi's flight schedule and put resourced into shooting her down. I doubt it would be worth the effort for either of them but my luck has been good so far but it could run out any day and so many people have lost so much. I'd much rather get hit but one of her few remaining dart strikes but I don't want to leave her alone either. Unlike me she'd never unalive of her own volition but I still can't bear the thought. She hasn't exactly shrugged it off when members of her squadron have been shot down but she doesn't really want to talk about it either. There's not enough spares to be burning old pianos anymore but every month cut the shape of a mini grand out of whatever's around and pour out some Jeremiah weed for everybody who stayed in orbit. Given the flight profile the orbits of the debris would generally reenter within a few weeks but it feels less depressing to think of them as just staying up there among the stars, or at least among the moon and all of earth's other satellites. One of the reasons for the monthly check besides the mission cadence is that that way their remains are still up there at the time of mourning.

These days there's something both disheartening and invigorating about the sorties they conduct, which is that they're seldom going on dedicated space to space missions, and are usually escorting our own darts or flying top cap for air strikes at lower altitudes. They can also provide fire support for troops on the ground directly, but it's usually a more efficient use of resources and launch mass budget to save their pulses for turning any anti-aircraft assets that dare fire on our shit into glass. They're all pretty encouraged by being on the offensive but there's something about escorting inanimate pieces of metal that doesn't seem worth paying in human life. Protecting air assets does but then they have to deal with the fact that as soon as they see a missile flash they'll glass the launch site but there's generally at least a few shots off and they try to get a track on them and knock them down before they hit anybody but it's impossible to get 100% of them. I guess I've seen her get a lot less somber since they started spending more time

flying top CAP and less escorting darts, but that corresponds to when we actually landed at Port Fairey and loosing people all the way back up to Darwin. I still wonder if anything of the actual city of Darwin is left, probably not. I want to think we'll know soon since Sydney should be back in UN/GSDI hands soon and from there it might seem like it'll be a quick albeit long range sprint up to the north, its about to be summer in the outback and she still has enough assets to make everyone's lives pretty miserable the whole way.

It's also worth noting that there's not many ports between Brisbane and Darwin. There's Gladstone but that's only 450 kilometres north of Brisbane and with considerably lower capacity, and it's another 2,000 kilometres by land and 3,500 by sea from there to Darwin. By the time the Army gets up there New Guinea and Timor should be fully secured to serve as nearby harbors to move in amphibious groups from but they still have to cross 600 km of open water full of lord knows what as part of her last ditch defenses. I'm not sure if they'll try to secure cape York first or just bypass it. Neither option seems good to me but I am only an arm-chair strategist. I am occasionally consulted on things like that but I mostly don't know what to say other than tell them what I suspect she has and hasn't developed. There will be more literal minefields, in addition to dingos sitting in hibernation mode and waiting for either a remote activation signal or a proximity sensor to activate them. Those four-legged mechanical monstrosities aren't even the worst of it. They can only hold a few thousand rounds of ammunition and then they have to either retreat or if she opted to sacrifice some ammo capacity for a self-destruct charge go on a suicide run. She can also leave nerve gas mines all over though, and optical pulse charges, and anti-vehicle pits, and ironically EMPs. All of those can be defeated but all of them are going to slow us down and get more people killed on the way.

I guess we're just going to have to accept some casualties at a certain point. That's sort of dumb though since she will always have her literal nuclear option. At a certain point they really are trading human lives for small additional concessions from her, but there's so much disdain for Celestia that even when they go public with whatever details of whatever negotiations do end up

succeeding, I doubt there will be any serious backlash. I mean she's already willing to abandon all her positions on the surface of the Earth, although I'm sure she'll keep something squirreled away either on or beneath the seabed. I'm sure we'll scour the world with them using what will within a few years be a sizable fleet of detector ships, and during peacetime they can operate much more freely. In fact it shouldn't be too long before we're able to build new ones. They've been trying to make ultra-low background steel since the war broke out, but so far only pre-nuclear steel will do. I guess we at least got the meme of bringing back all those old WWII and older museum ships, even in a support roll. There's actually an ironic exception there, which is the four Iowa class battleships are equipped for shore bombardment using rocket assisted and LORAN/GPS-3 guided shells. They don't do it too often though because even with the reduced powder charge the barrels don't have an infinite number of rounds they can fire before wearing out and there's not really a way to replace them. The old carriers are the most useful since they can follow up on any neutrinos detections using ASW helicopters that can be kept on board, but they seldom operate far from a modern amphibious assault ship equipped to do the same. Also there's a misconception that all those engines that they have bolted to the deck actually push the ships forward like a giant fan boat. That would be hilarious, but they're just gas turbines running electrical generators, and that electrical power is used to run electric motors attached externally and below the water line to conventional hydrodynamic screw propellers. All those measures are to keep the inside of the ship as clean and isolated as possible to do what its meant to do, detect neutrinos from nuclear reactors. That's the entire reason for needing pre-nuclear steel with no Caesium-137 contamination. You need several feet of ultra-low background steel and then you have to have a tank for of carefully synthesized superheavy nuclei with an extremely large neutrino interaction cross section due to some very clever quantum engineering and an exhaustive search for a viable synthesis pathway. That we've been doing it will I'm sure be public, including the quantum computing projects I worked on, but the actual isotope and the synthesis pathway I couldn't tell you because I don't know and I doubt they'll ever make it public,

which is a shame for amongst other things astrophysics.

We've sadly lost a lot of sailors already, and although ground losses have now been about double in the past few months. We'll be mopping up both for years to come, although hopefully with a low body count. The expense will be tremendous though, and I'm sure we've learned nothing from WWI and Versailles and will try to get her to pay for it all. I guess there's a key difference there that she isn't a human let alone a human society. The key difference being that human beings act according to human emotions mixed with external incentives in a sometimes rational sometimes not way, we really don't know what her emotions are. Being part biological, she almost certainly has some sort of feelings, and being cloned mostly from human cells with a little sea lion thrown in they presumably overlap with ours. She's also wired into the most sophisticated machines humans have ever built rather than the sacks of meat surrounding some calcium oxide based mineral skeleton. She definitely seems to have a survival instinct, and some of the pitfalls of fear that we experience. Deep down she probably has the capacity for love and empathy too. Unlike us though those feelings aren't mediated through cultural baggage in the same way. She's read about human culture, but the closest thing to one she grew up in was the early days of Daros. Really her first experience of the world was more like reading a spreadsheet instead of a bedtime story and reading it to herself in order to learn how to read. It's weird but so is bootstrapping a semi-synthetic consciousness.

I've actually been reading the confidential level reports on our losses. That's about as far up the classification chain as they usually let me go, but there's enough detail there. Without getting into specific numbers and myself into trouble this is going to continue to sting quite a bit. I spend too long wondering if Celestia cares, but if she does she also probably wants to hurt me specifically. I'm not sure which is worse, a sociopathic A.I. or an enraged one. In some sense the fact that Tomi is still alive is an indicator of how well the low observable characteristics of the dragon work. It's also an indicator of how many we have though. A typical escort sortie is a block of 4x 4 ships, so 16 in total launched on 8 boosters 2 abreast. Top CAP is usually about half that and they sometimes stagger those and do 2 full orbits. That's not always a

good idea though because they only pass over the target area on the second orbit, by which time she knows they'll be somewhere. We have pretty solid space and air superiority though so it's sometimes worth it to have more continuous coverage. They could also just stagger the launches but that would make it ever more predictable since we haven't wiped out all her orbital launch flash detection systems. I should be encouraged, she's a fighter pilot's fighter pilot and never believes for a second that she'd be the one to get blown to smithereens. She's too good, she's too fast, she can just see them before they see her and shoot first. I have both the perspective of someone who loves her and have seen the real numbers. She knows how many of her squadron have been lost. Her flight lead bought it on his last mission before she was due to upgrade to lead herself. It's not as bad as getting killed on your last mission, but it scared me shitless and it's one of the few times I've seen even the aftermath of her crying. It took a while to even get her to admit that was what had happened. A combination of information security and not wanting to talk about anything that actually scares her made it hard but she came back with red puffy eyes and the telltale smell of having thrown up. It's not uncommon for Dragon pilots to disconnect from everything and vomit after clearing the perfluorin from their lungs. The signs added up though, something was wrong and I didn't exactly get her to open up about the terrible nature of death but she admitted with a terrible hesitancy on the edge of tears in her voice that Captain [REDACTED] was gone, but continued that I should save my sympathy for his family if I run into them. He got a posthumous DFC and I tried my best to do just that at the ceremony. She still upgraded, the wing commander signed off on it and she started training a new wingman.

The odds aren't really against her at this point, they're just not enough in her favor to get me to stop worrying about it. That's just part of being human, maybe part of being sentient, if it's hopeless you can give up and mourn, if it's safe you can worry a bit but know it'll probably be ok, but the closer the odds get to 50/50 the more stressful things become. Her survival chances aren't quite split down the middle like that but they aren't far off it. I won't say what the actual loss rates are because I know they'll

just censor it, even after this is over. Maybe after a decade or two they'll let everyone see the real numbers but there still some things from WWII that are still classified and there are far more secrets that died with the last person who knew them. There will be lots to account for when this is over though, and the ass covering has already started. Some people have already put theirs on the line so even if they were a bit unscrupulous nobody will dare go after them, but there's plenty of people that weren't even living in areas exposed to dart strikes who've done some god awful things to either help us win, advance their careers or both. The people that really sacrificed human lives just to look good or make a buck will all figure out how to hide, but there's a few middle men here and there that'll get left out to dry and serve as patsies. I'm not sure if that's better than nothing or not.

One thing I am relatively sure of is she can't 'win.' I sometimes wonder if she'd hand over Sam. Maybe she would, but I doubt we'd be willing to offer any concessions for that which would actually be worth it. I'd get to say my peace but at this point I don't even care. I spent a long time being mad at her but at this point it's the purely practical need to stop Celestia and a desire keep Tomi alive that motivate me. I mean if Sam were sitting across from me now what would I even say? "fuck you!"; "I told you so!"; "this is all your fault!"; She knows the world is mad by now, she'd downplay any warning and blame it on us anyways and honestly someone was going to do it. If it had been anybody else we might have had more time to prepare but even that is debatable.

9 Survival

Kelly is dead. She's gone along with about a quarter of my immediate colleagues at the capabilities assessment office. I can't imagine that strike will stay off the news for long. That level

of saturation attack shouldn't be possible to that bitch still has more than a few tricks up her sleeve still. From what I've pulled together so far she probably used almost all her remaining land attack subs to launch a saturation attack of almost all decoys in parallel with what must have been most of her remaining boosters. She knows we shoot almost all of them down before she can recover the first stages these days so she saved her pennies and launched everything at once. There's going to be hell to pay but as far as I can tell POTUS and the majority of the line of succession all survived. I don't think congress has met in person in 3 years so the target was definitely all the technical staff that were still in Washington. Those of us out on the east edge of the Rockies where most of the labs are located are all way to spread out but DC was one of the few concentrated targets we kept so well defended it was largely intact. I'm not sure what she thought she could accomplish. I haven't even had time to process that one of my few friends from before that I've seen since this started is gone. I'm also probably a bit more exposed politically too now but I really don't know. They're going to be running constant patrols after this and I know Tomiko will volunteer to fly more than her hundred. I can't handle losing her, that was my first thought was to thank whatever god there might be (and I have a hard time imagining one who cares after all this) that she was with me last night. The base is still fully intact and wasn't hit at all so she went in this morning. We were both up all night and she was [REDACTED] so I imagine they'll be prepping today.

I'm not entirely sure what to do in all honesty. We've lost so many people over the years but it seems like hardly anybody I knew personally. I'm pretty sure my brother is alive but I haven't talked to him, he and my entire family probably went through hell when the war started. By now I'm sure they're keeping him busy with something but not letting him get near anything sensitive. There's plenty of work to be done that doesn't directly touch anything vulnerable or immediately defense related. In fact most of the country and world economy is still just keeping the lights on and feeding everybody. I thought the increased bloodshed these days wasn't going to touch us because we were taking the fight to her. That's not how things work now though. In a world of

orbital spaceflight there is no such thing as out of range.

The NF-88 exemplifies tactics in low earth orbit in a lot of ways. It's entirely unsuitable for use in deep space but has pretty lackluster handling characteristics in the majority atmosphere. It does what it's designed to fantastically though, make a few (or usually just one) orbits, sometimes skipping through the upper atmosphere to provide additional maneuvering options. The early models did at least have some go ability for powered flight in the atmosphere using electrically driven ducted fans, but the fans and ducts have since been removed in favor of more fuel storage. They were mostly installed because we weren't sure navigation would be fully reliable due to jamming from Celestia and they weren't confident it would be possible to bring the vehicle to its post reentry glide path consistently enough. It turns out its better to vent any remaining fuel before reentry and its so rare to miss the reentry glide corridor the pilot can just eject if that happens. It's also rare to come back down with full tanks anyways because it's almost always better to just keep the capacitors charged up in case they need to fire the lasers again and even up at █████ km they still leak a bit due to the residual atmosphere. In both cases the electrical power comes from the gas generator turbine, which also electrically drives the fuel pumps. Getting the Pegasus engine to work was honestly more work than installing a wraith interface in the spacecraft. The interface itself was still way harder, but they had that developed for the wraith sub itself, which I think is officially named the coelacanth.

The time they have on station is so short they have to be able to fire pretty quickly. They don't really have the option to store much power other than the capacitors for the individual shot. It only takes █████ to recharge them from the gas generator though so they can get all their shots off within the firing window. The extra weight of the fans and motors is much better used for more fuel, provides additional shots and/or on orbit maneuvering. Tomi has never flown on the A or B models that had the fans, only the C and now the E. It's actually one of the few things that doesn't worry me. If she somehow reenters somewhere without suitable landing field she can just eject. Once she's survived reentry there's seldom anything to worry about. On the rare occasions I've been

allowed to sit in the and watch things play out I've been feeling my heart beat out of my chest until the ionization blackout is over, but once it is I always start calming down. I don't think there's been a single post entry fatality in six months, excepting injuries sustained during combat over the target, but even those they died in the hospital hours or days later. I do worry about that happening. I guess it would be less terrible, I'd get to say goodbye but I'd have to watch her slip away.

I guess I shouldn't be so morbid or so self righteous about it. Plenty of people have lost more already than I do in my worst nightmares. I just don't know how to live without her. I've started to feel like this before about Sam but that was different, I always knew she wouldn't be that for me, I'd always be at arms length unless I was useful. Tomi does try to keep me from making her my whole world because I'm clingy and she knows she might not survive but it's one of the only thing she fails at. God I just want this to be over. It just keeps finding new ways to get worse though. I miss Kelly already, even if I hadn't seen her much in the last few months. I wonder if there will be an in-person funeral or not, I'd like to go if there is.

I haven't been to see many people outside of work and Tomi since this started. I only have the ability to stay with her because I've made deal after deal with the devil to move wherever she goes. I've only seen my own family once since the day the shield went up, I've technically been to see Tomiko's family twice since her mom already had cancer and we went to go see her. It was my only chance to meet her family and possibly her last chance to see her mom, who is a wonderful old woman. We didn't even have to be "roommates" since I was important enough that being adjacent to me was a good thing. We did have to downplay certain things and avoid PDA but that's normal, I guess. Idk, I've never been straight. I think it's also that her dad is half Korean, that's honestly why they left Japan in the 80s. Her dad's parents fell in love and things were still pretty rough back then for anybody of Korean ancestry in Japan so they came to America. Her mom's family had emigrated before WWII even and taken to the long profitable practice of vegetable farming and shipping them back to Japan. The margins were always decent but after

the post war industrialization it became quite profitable, although honestly some of that is both laxer regulations and even higher farm subsidies in the US. Anyways they might be a little weird about it but since they had their own little cultural defiance for love they're sympathetic. Honestly, they're better than my parents, who are exactly the sort to say how ok it is to be gay until you tell them you are. I mean they're not that bad, the hypocrisy is just irritating.

The only reason I'm even here is because I had such trouble admitting to anyone after my parents that I liked girls, that I felt something different when I saw my friends than everybody else seemed to. I was so scared after they basically told me that I couldn't be because "we know you and we know lesbians and you're not like that." It took someone like Sam that would draw me in to a false sense of security to get me to come out again. I mean all this would have happened most likely, but I wouldn't have a story to tell or be anyone of note. I'd like to think so, either that or Sam never could have made Celestia without me. I really don't like that idea. It might be true though, I guess we'll never know. Hopefully we never find out if anybody is capable of doing it again. I'm sure we'll find out some new horror though.

I guess I did have it pointed out to me recently that although killing Sam has little value capturing her alive does. I've advised plenty on doing both but in recent times there's been a definite uptick in interest in the latter. The reality is they do want to know the ins and outs of what makes Celestia tick. It's also a reality though that if they got Sam alive they'd have to either make it look like she was already dead or eventually execute her. Telling the public "we have the human leader of the enemy faction but we're keeping her alive for intelligence gathering" wouldn't go over very well, especially since they'd have to tacitly admit they wanted to know how to build hybrid A.I.s of their own. I'm sure they'd like to call it "our own" and if I'm being more honest so should I. I might deride the various powers that be but at the end of the day I work for them, and not just under duress. I genuinely want to defeat Celestia and I want there to be some sort of a power structure centered on the US and liberal democracy. I'm always gambling that I'll only get the first half of that and I could refuse

out of fear of just such a scenario.

From where I sit now I actually do have some reasons to be optimistic about the future. Humanity has rallied together, even if it was just to defeat a common enemy militarily. We've advanced our technology considerably, we'll probably manage to curtail climate change without even trying given how much power generation capacity we've installed, most of which is carbon free or carbon neutral for reasons having nothing to do with climate policy. Despite the pause on deep space exploration we've massively built out our space launch capabilities. Even the WRAITH interface will probably do some good and make it possible for people to interface with and somewhat democratically control the ever more sophisticated hard and soft A.I.s (by which I don't meant weak or strong, I mean purely silicon based vs squishy biologically based, although strictly speaking those are hybrids and a pure soft A.I. would just be a fully synthetically engineered animal). We've also figured out a lot of distributed manufacturing and made a lot of necessities available universally. I'm glad all that has happened but the sheer fucking brutality of why comes back like a wave finally crashing into a breaker every time. In the back of my head I'm just already thinking that this time we basically all fought against the one synthetic consciousness, but next time we'll go right back to fighting each other, but this time augmented and manipulated by them. I hope I don't live to see that. I have the sinking feeling that even if I don't some people will, even if they haven't been born yet. If the world wars of the twentieth century are anything to go by it'll be about one human generation, but given the much faster pace of A.I. life cycles it could be much shorter. I suspect it will be about 20 years though, since it's all fundamentally driven by humans and our societies.

I should really care if we survive to raise kids. They'll have to live in that world. Even if we don't there will be a future and children who grow up to live in it, and I should like to think we both care about that. It's hard to care about much more than making it through the next sortie though, for both of us. She has to be on her A game every time, and I have to do whatever it is I do around here. Show up and review the latest estimates of [REDACTED], run some simulations, write a couple of memos, and write this

stupid memoire when I get home. I'm not entirely useless, at least I don't think I am, but this thing honestly might be. Who knows what will make it through info-sec review or if this will ever see the light of day. Hopefully after this is over more things go back to normal and all the wartime censorship goes away. It probably will but I'll still be in an unusual position. It's not so much that they'll stop me (although some things they certainly will) it's more so that I need to keep my damn mouth shut if I don't want to open myself up to all manner of public scrutiny that would most likely not do me any good.

The real problem I have now is that I've ended up in a situation where once I'm not longer useful I'm a liability not to any shady figures (although I've met a few, the smart ones all have couriers and proxies though) but to myself. Once I've outlived my usefulness nobody is going to come take me out but they are just going to kick me to the curb. I could just go full dependa and latch onto Tomiko, she'll probably stay a career officer if she can even after all this. That's what I'm hoping for deep down, although I'd like to become a teacher or try to do something useful. I guess I am always a physicist, but like I'm also that girl who dated Samantha Kassick, so I'm a PR liability to say the least, even if I've been a PR asset for the government during the war.

So she asked me to marry her and it was the first good thing to happen in a while, and immediately joked I should just change my name to hers, but like I'm actually going to. I doubt it'll erase my name recognition, but it'll help. I was assuming we'd get married but I assumed I'd have to ask, but she finally had some time and a ring. She asked me to draw out a diagram of a two circle fight and I was like "why, you know it better than I do?" and she said "it's for the office, they wanted wall art by a proper physicist" so I got out some marker and started drawing and as soon as I had two circles and was about to add all the vectors she brought me one of those giant pads like you put on an easel to flip through at a meeting and told me to open the big markers. I just went to go look through the drawer but she handed me a nice fat marker with one of those cheshire cat smiles and I thought she was making fun of me for being less organized than her, which I usually find funny anyways but I rolled my eyes and smiled back as I took

it and started to go back into drawing mode as I opened it but then I saw the obvious on top of the felt. I could see the glint of gold and thought it was just a fancy marker but when I pulled the cam all the way off I realized what it was and my heart skipped more beats than I could count to and she flipped the page up to a question mark. I cried and said as many yesses as I could muster. We spent the rest of the night talking about everything good we still have in life together. Not even the war was going to ruin that.

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