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## Floornight

by [nostalgebraist](#)

### Summary

In the near future, science has discovered and investigated the reality of the soul, a top-secret facility on the ocean floor monitors the depths for creatures beyond human comprehension, and its eccentric inhabitants balance the familiar challenges of life, love and fulfillment with the surreal challenges of a continually shifting, mind-bending new reality.

### Notes

This is original fiction. I've been posting it for a while on my tumblr, but wanted another home for it. I'm using AO3 because I like the site's layout and because I think this story might be enjoyable to a fannish audience (e.g. some of the tumblr friends I met through the Homestuck fandom have enjoyed it).

Inspired, most directly and influentially, by Neon Genesis Evangelion and the Southern Reach trilogy. (Other inspirations include Pacific Rim and about a hundred other things.)

My original goal in writing this story was simply to get myself to write words on the page. Over time it's developed a plot and a style that I'm happy with, but it's still written and updated quickly with fairly little editing. Consider the current form a draft, albeit one I'm sufficiently happy with to show it to other people.

My personal opinion is that the story hits its stride around Chapters 5-8.

For Kindle users: the Kindle .mobi file produced by AO3's "Download" button does not have chapter information and has some formatting problems. Instead, follow [this link](#) to get a properly formatted Kindle version of Floornight. (If you're using something other than a Kindle and want a .epub file instead, use the one [here](#).)

## Maria

It is dark in the submarine, and Maria is ready.

The viewscreen shows nothing, only the void that is human-visible Maxwell Light down at 4 km. Maria can only see her hands in front of her thanks to the dim, candy-colored lights on the control panel. The atmosphere resembles that created by driving a car in the middle of the night. She thinks this every time, although it ceased to have meaning years ago. A stock memory.

The automated voice, impeccably calm, just on the male edge of genderless synth:

*Abnormal storm of Boltzman detected within 500 meters, amplitude 5.6 kCept. Storm statistics are non-Gaussian and heavy-tailed,  $p < 0.05$ . Mean Boltzman type is non-human,  $p < 0.01$ . Mean Boltzman ethical status on Metric S is Indefinable, Class 2. Heteropneum attack is imminent. Are you ready to engage?*

The question is a formality. It does not matter whether Maria is ready to engage. But something will happen when she says yes. It has happened thousands of times before, and she still shudders.

"Yes," she says to the voice.

A flash of light. It is not dark in the submarine. The Pneuma Light that pervades the ocean floor shines in through the viewscreen, a chilly blue expanse of vaguely circular patterns within vaguely circular patterns, something like a pattern a magnet might produce in iron filings. Bits of it vibrate slightly as the harmless pneumatodes wiggle their way along in search of crevices in which to burrow themselves and absorb Pneuma Heat. Further off, Maria can see a mirage-like shimmering in the pattern, the telltale sign of Heteropneum radiation.

*Heteropneum at 300 m and closing. Pneumase stores are in position. Weapons systems are primed and ready for innervation. Do you, Maria N., agree to undergo eigensoul decomposition?*

She always shudders, even now.

"Yes," she says to the voice.

It begins at it always does: a feeling of curious internal movement like the stirring of hope, romance or perhaps indigestion. An unnaturally uniform pricking of all her arm hair. Then, a full orchestra of internal motion tuning itself.

Voicelessly, she repeats the litany, now just words made empty through repetition:

*The lie is the I.*

*I is the lie. I "am" not.*

*Nothing this self can achieve can satisfy this self as a self.*

*Do not cling to the aspirations of this self, whose very coherence has been proven a falsehood.*

*The cause is real. The pneuma is a fiction.*

*I will find my satisfaction on the other side, where there is no "I."*

*I "am" not. "I" is a weapon.*

*Even the most far-fetched hope can be weaponized.*

*Weaponize the self.*

A mirror shattering; a thousand voices call out in cacophony as the pneumases, crawling like dutiful robotic centipedes across the contours of her soul, radiate their own Boltzman fields. Swimming in some long-forgotten pool. The shape of an elbow, dissolving into mere motionless shape, dissolving into the mere notion of "shape." A Maria who is hungry. A Maria who is tired. A Maria who hopes -- for the unspeakable summer, yes . . .

A Maria tapping her foot lazily on the edge of some floor-set mattress, reading a magazine.

Enemy fire. Multiplicity. Thousands and millions of --

## Miranda

Miranda's office is a mess and has been since about 3 months ago and is not going to stop being a mess for, if we're being honest here, at least another 3 months and, again, to be *perfectly* honest here, Miranda is fine with that, because Miranda's job, despite being one of the most significant command positions in EPRN, involves as much EPRN bureaucracy as it does real command, judged per unit of time anyway, and how the hell, really, is she supposed to get around the injunction to file a report on every detected heteropneum when they detect literally an average of one per hour without building up some clutter. You know?

Miranda is, on some basic core-personality level, okay with bureaucracy. Life is enough of a swirling and inchoate void, most of the time, that she can deeply sympathize with the urge to organize it in *any* way, even if it doesn't really *accomplish anything*. Filing reports gives her a sense of "official understanding," however ill-founded, that would be sorely missing from her life otherwise. Heteropneums being, after all, being beyond complete human understanding pretty much by definition.

What really *frustrates* Miranda is not so much the necessity of filing these reports, say, as the kind of whimsy with which the founding codes of EPRN's bureaucracy were written. Which, Miranda tends to think, is entirely *incompatible* with the sort of pretend-organization-of-a-lawless-universe idea that she uses to justify stuff like filing reports to begin with.

For instance: the mandate to *give every heteropneum a name*. Who the fuck came up with that? Why not numbers? What, after all, would be wrong with the pseudo-precision numbers allow, in this of all contexts? Miranda would love to be able to rattle off designations like "number 4436" as though the texture of that number, its particular role in a sequence, meant something chilly and clear and rational, even if it transparently didn't. But no: she has to come up with a name, in words.

She had started with human names, because that seemed, at the start, like a pretty much inexhaustible reservoir of quickly accessible possibilities. Jake. Serena. Madeline. Herbert. Fatima. Will. Liam. Li. Olga. Eventually this became both boring and, surprisingly, somewhat difficult. It was hard to remember which names she had and hadn't used before, and there were only so many names she actually *knew*, anyway.

To solve that problem she had started going with the most outlandish or downright silly words she could think of. Cupcake. Mandible. Heliotrope. Budweiser. Toast. Earwax. This ran into its own pathetically predictable-in-advance subtype of problem, which was that some of these heteropneums turned out to be either scientifically interesting or destructive in ways no one wanted to remember. Earwax was one of the latter. Once Miranda had seen and hugged a good friend, curled fetally, mumbling a set of words including "earwax" in between sobs -- knowing that she, Miranda, was solely responsible for the queasy and entirely unnecessary but unfortunately unignorable comedic aspect of this completely sincere display of grief -- she knew she had to go to a new system.

That had been several systems ago. By this point her system is roughly: no system. She just writes down whatever comes out of her head, and does a quick check to make sure it hasn't been used yet.

The latest one, though, deserves a *little* more thought. This is the biggest one in weeks. Field amplitude over 5, which is pretty rare -- anything over 3 is considered dangerous, and 5 is well into the range where things start to get interesting from a purely scientific perspective, because humans don't even *know* how to make a field that strong. In fact, it has been proven by Hermes Cept -- godfather of pneumatech and now resident ancient insufferable curmudgeon on the EPRN Governing Board -- that using the standard soul-coherence axioms, a field that strong was *impossible*. Well, so much for the axioms.

Maria -- *my girl* -- had demolished that thing in under three minutes.

Miranda smiles, sips the first sip of this floorday's fourth cup of coffee, sits back far enough to make her desk chair creak discordantly, and, after pushing some fat stack of paper off the edge of her keyboard and onto the splayed pages of *Progress in Boltzman Ethics Vol. 17*, types in the name of the latest heteropneum:

"Nice Try."

## Kyle

Kyle has learned a great many things in the last 24 hours. For instance:

That his guardian James is not, in fact, his uncle.

That James does not, in fact, "work from home doing tech support."

That James does work from home, but for the government.

That James works for a part of the government Kyle had never heard of.

That this government organization operates from the floor of the Atlantic Ocean.

That there is a huge inhabited sphere on the ocean floor and that James goes there once a month.

That something had happened which meant James had to take Kyle with him to the sphere, but that James could absolutely *not* tell Kyle anything about the nature of this event.

That it takes about two very boring hours to reach the ocean floor in a government deep-submergence vehicle.

That James' boss is a tall, sardonic woman named Miranda.

That James and Miranda could not tell Kyle very much about what it was that they did.

That, there being no light to speak of on the ocean floor, days are created there by patterns of artificial light, which didn't strictly have to be 24 hours long, and whose real lengths are determined by machines that carefully watch over the brainwaves of the facilities' inhabitants while they slept and determined what patterns of illuminations would be best for morale and mental stability.

That the artificial lights are not, technically, *electrical* lights.

That James and Miranda sigh and look peeved when they have to correct him on this.

That the lights run on something called "pneuma," which, they assure him, will be explained to him tomorrow.

That "tomorrow" was in this case, of course, the next computer-designed "floorday," as distinct from actual earth-revolution day.

That asking why these people hadn't just gotten used to saying "day" instead of "floorday," given that after all Miranda at least seemed to *live* down here, only gets him stares and slight parental-like winces.

That tomorrow he will be introduced to someone named Maria, who is supposed to be his "pneuma bond," whatever that is, and that this is something that both adults desperately seemed to hope would clear up any of his clearly more undisguisably irritating questions.

That James lives in an apartment-like space with two rooms, one of which Kyle is to sleep in.

That personal quarters inside the sphere have "windows," not real windows, but glossy computer screens serving the same approximate function.

That asking James about the purpose of a glossy black surface showing you the pure blackness of the ocean floor is probably not a thing that could be done tactfully at that point in the floor-evening.

That James is very, very tired and is going to bed early and that there are some books in Kyle's room if he wants to read them.

That Kyle, also tired if still full of plucky adrenaline, would rather stare vacantly at a blank "window" waiting for sleep than read any of the books, which were mostly Robert Heinlein, Philip K. Dick, and incomprehensible textbooks with titles like *Applied Extreme-Emotion Dynamics In The Near-Field Limit* and *Pneumabiology of the Lower Ineffables*.

That his bed has a voice.

That the voice sounds like a bored man trying to retain a veneer of professionalism.

That the bed wants to inform him that "EPRN regulations" required him to attach a set of electrodes to his head before falling asleep.

That EPRN regulations also require the voice to inform him that these electrodes were themselves mostly a formality, as the information gleaned from them would merely constitute a minor supplement to the things his bed would learn via its "highly sensitive animatic resonance detectors."

That having received this explanation once, he would not need to hear it again on successive evenings.

That the electrodes would be attached automatically once he gave his consent.

That he is really very very tired and that after saying "yes" the feeling of a set of robotic arms mussing his hair and applying wet sticky paste to his scalp and pressing chilly little metal pads firmly into place really isn't so weird or jarring, as feelings go.

### IN THE DREAM

Kyle is sitting cross-legged on the floor of the ocean. Around him is water, but it is not cold.

He can see nothing, but he knows where he is.

Then there is a thing he can see: a small scuttling creature that dimly illuminates the space around it. It has maybe eight or ten little legs and is furry. It looks a bit like a tarantula. It pauses and looks up at him. It has a face, an incongruous face with big dewy eyes. It is *cute*. It looks like some sort of CGI advertising mascot.

"hello, [potential-friend] [you-who individuates]! [this-one-who-does-not-individuate] is glad we could establish this interface!" says the little creature.

Kyle doesn't know how it is speaking. The words appear in his mind, not quite as heard *words* but in some place between words and concepts. Some of the words are fuzzy at the edges, somehow.

"Hello," Kyle says to the creature. When he opens his mouth, no water flows in, and this seems right. "Who are you?"

"[this-one-who-does-not-individuate] is one of the [Teeming] who live here on the floor and in the trenches, among the baths of [Pneuma Heat?]. [we] are not human and [you-who-individuates] are human, and so there is an unavoidable [communication

barrier?] given the nature of this interface. [we] apologize, but [we] [hope] the contact will be [valuable/fruitful?] nonetheless."

"I have to admit, I don't understand most of what you're saying," Kyle says. He feels . . . embarrassed? . . . at the possibility of disappointing the friendly little cartoon creature in front of him.

"[we] understand," it says. "[you-who-individuates] may come to understand one day, if we use this interface for long enough. we only want to be [friends] with [you-who-individuates]. and after all, one day [you-who-individuates] will inevitably become part of the [we-who-are-friends], as [dictated?] by the [Unfolding]."

"I . . . see," says Kyle, though he doesn't see.

"there are [irregularities] in the pneuma of [you-who-individuates] which [we] find interesting and possibly conducive to the [Unfolding]. [we] will continue to investigate them whenever able. [we] [wished] to make [you-who-individuates] aware of this."

There is something very, very strange about the words that the creature has been putting in his mind, even though whenever he mentally grabs onto one of them it ends up seeming just like an ordinary word.

"There is something very strange about your words," Kyle says. (Why had he said *that?*)

"the emanations of the [Teeming] cannot be easily translated into the terms of a human pneuma," the creature says in a chipper, pleased-to-help voice. "the [Teeming] [sleep] and [commune?] on the sea floor as [we] have for eons of your time, guiding the [Unfolding]. this earth is not meant for the nature of the human pneuma and [we] wait for it to inherit [us]."

A lance of fear, with the suddenness only available to the emotions of dreamers, pierces Kyle's heart.

"[you-who-individuates] are experiencing [pain]. [this-one-who-does-not-individuate] is sorry." The creature's giant eyes deform into a cartoon caricature of empathy. "but the [Unfolding] requires this."

"Tell me more. Tell me what you mean. I *have* to know." Kyle is suddenly desperate.

"[you] humans will eventually be overtaken by [us] as a matter of mere fact. we do not [vaunt] or [lament] but merely [state] that your [darwinian?] souls are [competitively suboptimal?]. pneumatech built by a coupling with the [quasispecies equation?] cannot [use?] the feeling of [,,,]. you do not grasp [abjection?] or the essence of [weeping?], which is fully [purple?]. it is difficult to explain to a human pneuma without a [???]-level interface. without [,,,] you lack the [complete?] [storge?] to stably cooperate in [iterated prisoner's dilemma?]."

Kyle stares. The creature smiles a smile of perfect innocence.

"[we] would not disclose the basis of our nature unless we thought it conducive to the generation of [storge?] and [friendship]. [we] are [wonder-feeling?] in the direction of [,,,] towards the the pneuma of [you-who-individuates]. [we] will contact [you-who-individuates] again. but even when [we] do not contact [you-who-individuates], [we] will be watching [you-who-individuates] for [irregularities]. goodbye."

OUT OF THE DREAM

The robotic arms remove the electrodes a minute after Kyle wakes up, but leave the chilly paste in his hair. It takes Kyle a few minutes, in the shower, to get it all scrubbed out.

## James

It's hard to know how to begin to tell a 17-year-old kid government secrets about the nature of reality, especially when you're pacing around the room from stress *before* you're even had your morning coffee and you're worried about what actually *having* the coffee would do to you.

(Everyone in the Sphere drinks a lot of coffee, which is probably a reaction to the fact that no matter how many bright lights get shined in your face in the "morning" and no matter how many Vitamin D3 pills you are required to take, your brain can never quite adapt to never seeing natural sunlight. "The Sphere" is what it's officially called, incidentally. Like the Pentagon.)

James is pacing and he doesn't know where to begin so he begins with the simplest thing he can say, which is:

"The soul is real."

Kyle, sitting on the bed in that slightly-too-nonchalant posture typical of lanky teenage boys who don't seem to have quite decided what their limbs are for, nods.

"A DARPA scientist named Mohammed Salim discovered it thirty years ago when studying so-called parapsychology. Psychic powers. ESP. That kind of thing." James paces jaggedly. "It turns out that there's a sort of energy field pervading our bodies that underlies our thoughts and emotions. Obeying its own unique laws of physics, totally distinct from anything science had seen before. Salim called it 'pneuma' -- the breath of life.

"Our brains don't *really* do anything important -- the pneuma just uses them as a kind of computer for simple calculations. The way pneuma *itself* works is far more complicated. Salim thought it was impossible to explain. He ended up concluding that science had come to an end, that the world was telling us we could go no further, that the mind was mystical and incomprehensible.

"Except that just months after Salim discovered the pneuma, another scientist, Hermes Cept, came out with a theory that explained every experiment Salim had done. Cept's theory was a set of hopeful, daring approximations. It made no claim to *truly* explain the soul, only to give us a simplification of it that could prove useful. It proved very, very useful. Using Cept's equations, we learned how to precisely detect pneuma, predict its motions, generate it, convert it into physical energy."

Kyle blinks. "So why doesn't anyone know about this? Why is it a government secret?"

James sighs. "It's complicated. Part of the problem is that half of the people who know about pneuma think that that very knowledge is unethical, that we've opened Pandora's Box. People whisper about plans to assassinate every pneuma scientist, destroy everything they've written, re-close the box. We're playing with the very stuff of the soul, here.

"Let me give you just one example. When we do things with electrical energy, it tends to produce electromagnetic radiation. Light, radio waves, and so forth. Pneuma processes do the same thing -- and the radiation, like all pneuma, *is* conscious. The pneuma equivalent of 'light,' according to Cept's theory, is a simple, stable, and pleasant consciousness, like a relaxed person on the edge of sleep.

"But pneuma processes also generate random fluctuations in the pneuma fields. Cept called these 'Boltzmen.' They're entirely formed conscious minds, appearing randomly out of the sea of physical fluctuation. Every time we turn on a pneuma-powered light" -- James pointed to the ceiling, where an ordinary bulb glowed -- "we generate thousands of Boltzmen. Most of them last for only tiny fractions of a second before disappearing. They're random minds, in random states of being. When I turned on that light this morning, I created people in states of bliss beyond anything you'll ever feel, and people in states of agony beyond anything you can imagine. Fleeting people, existing for only a moment and then dying without warning. Should I feel good about that? Bad? Neither?"

Kyle shrugs. "You've got me there. But come on. The government's done worse things."

"Right. It's not the Boltzmen that force us to keep this stuff secret. It's not even the destructive potential of pneuma, the fact that by manipulating souls we could make something far more powerful than any atom bomb. It's what we discovered down here, at the ocean floor."

Kyle throws up his hands in an "oh, *now* we're getting to the point" gesture.

"Physically, this is a place starved for energy. It's cold, there's no light. The only life that can survive down here is life that feeds on dead things from above -- it's dependent on another ecosystem. That's what we used to think, anyway. But it turns out that there's *tons* of energy down here -- *pneuma* energy. Radiating from the ocean floor, for reasons we don't understand. There are lifeforms down here that, invisible to physical light and touch, whose souls glow with a power that dwarfs ours. In terms of soul -- pneuma -- this is where the action is. Life on land is just a blip on the radar. Compared to the kinds of things that live down here, there isn't much difference between our souls and the souls of dogs, or mice, or cockroaches.

"Some of these lifeforms seem to be aware of us. Some of them seem to have . . . ambitions of conquest. We're already in a tight spot, trying to research them however we can, trying not to let them know anything more about us than we already knew. If the whole world knew about this, instead of just one little government agency in this dismal little base? *Someone* would fuck things up. Someone would give these things -- the *heteropneums*, the alien aggressors -- whatever it is they need to come to the surface and wipe us out. We don't know why they *haven't* done it yet. All we can do is try to make sure it never happens."

James has just started some coffee brewing. It's going to be a long floorday.

## Ratio

Ratio Tile wakes up happy. Ratio Tile is happy for several reasons:

1. He is lying in bed with Jorge's arms around him and this tends to make him happy
2. The solution to the pseudo-refractive paradox just came to him in a dream and solving physical puzzles always makes him happy
3. There's a Governing Board meeting today and while those are sometimes boring this one is likely to involve some *very* fun discussion of the massively fucked-up data from Nice Try and discussing new data always makes him happy, *especially* when it's data that can't be easily explained in a soul coherence framework

Ratio Tile is now wondering whether he can pick up his laptop without waking Jorge up. Ratio notes that now that the pseudo-refractive paradox has been solved he has no puzzle to think about and so it will be pretty boring just lying there *even* with Jorge's arms around him. Ratio can lie there with Jorge's arms around him pretty much indefinitely when Jorge is awake because awake Jorge is a source of many wonderful sorts of sensory input. But Ratio has long since accepted the fact that without continually varying sensory input he will need a puzzle or he will become bored.

Ratio is both often happy and easily bored, and the tension between these things tends to end up determining whether any given person likes Ratio or not. Jorge, for instance, takes the boredom problem as a challenge and has become a virtuoso of boredom-solving. Jorge takes great pleasure in this.

The foregoing rule only applies if you're not a scientist. If you *are* a scientist, you probably hate Ratio, because he's pretty much unbearably obnoxious in any kind of scientific discussion. Ratio is aware of this and is not so much proud of it as neutrally accepting. Like many scientists, Ratio is not so good with the subtleties of social decorum, and Ratio's long since decided that trying to compensate for his particular brand of social incompetence would simply complicate things and possibly worsen them. He is a force to be taken or left, warts and all. And, thankfully for him, no one in the tiny Pneuma Science community is going choose the "leave" side of that fork when he's demonstrably the most productive person in the whole community except for (fucking) Cept himself.

Anyway, Ratio's managed to disentangle himself from Jorge's arms without even producing so much as a mumble, and has gotten his laptop in his lap and his headphones on. Today's soundtrack is going be Mike Oldfield's *Amarok*. Ratio listens pretty much exclusively to long-form prog rock and the like, which is the only kind of music that un-bore him in the same way that puzzles unbore him; finding newly biting ways to mock him for this has been one of Jorge's favorite hobbies since they met. Ratio finds this boring, and he's not sure Jorge's quite picked up on that, which given Jorge is pretty surprising, and Ratio's not sure whether to feel proud or ashamed of outfoxing Jorge in the make-Ratio-unbored chase. It is a strange game, the one they play.

Ratio gets to his email inbox just as Oldfield gets beyond his choppy introductory bursts and into a nicely hypnotic repetitive space. Ratio's inbox looks like this:

[quantum-comp list] digest for 3/29/20xx

[pneum-engines list] digest for 3/29/20xx

**Cecelia R.** new notes on the axiom 3 stuff (good shit imo)

[pneum-alt-theory list] digest for 3/29/20xx

[hn-data-mining list] digest for 3/29/20xx

[pneum-category-th list] digest for 3/29/20xx

**MeowEllipse** Re: Re: Re: Re: Re: Re: Re: Re: Re: Theoretical Output of Class 3 Matter Extruder in Expanded StarChild Universe

MeowEllipse StarChild Universe Wiki news for 3/29/20xx

**Cecelia R.** is it just me or does this paper make no fucking sense (nbd peruse at leisure)

[mid-field-limit list] digest for 3/29/20xx

**Traveller652** Re: typology and generative language for guitar solos -- ideas?

**Jorge S.** Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: Re: dude

## Hermes C. Theory for Nice Try

And right there Ratio stops reading and cringes and clicks. The email is (fucking) Cept being his usual terse self, because he knows everyone knows it's implied that anyone who comes to the meeting without reading *and* understanding the attached document is in big trouble. The meeting is in two hours, by the way.

Oldfield's just started doing something particularly groovy and it gives Ratio the strength of will to plunge into the document itself, which is pretty much what he expected. In Cept's blustery prose style, his introduction informs the reader that the time course of the Boltzman field during Maria's struggle with Nice Try is explicable within a soul coherence framework, given an intuitive set of assumptions including blah blah blah blah

The soul coherence axioms are Cept's baby and he now maintains his attachment to them with a perverse determination that at times seems almost sexual. Five years ago Cept was saying that fields as powerful as Nice Try's were theoretically impossible. Now that they've been *observed* Cept has started to exploit tiny ambiguities in the original statements of the axioms to "show" that the original axioms *still* agree with observed data. It's an interesting game, in a way, and the old fuck's very, very good at it.

The problem is that Cept's methods are entirely *ad hoc*. His theory for Nice Try consists of a bunch of noodling around within the soul coherence framework that he *never* would have done if Nice Try had never been observed. He isn't doing *science*.

Unfortunately, there is no *alternative* to soul coherence theory. There are theoretical games, incredibly beautiful and fulfilling theoretical games full of incredibly non-boring puzzles, that Ratio and his friend Cecelia have been playing for years, which keep yielding tantalizing insights. Like last night's resolution to the pseudo-refractive paradox. (Try to explain *that* one elegantly, Cept.) But no consistently usable, unified theory. Cept's ad hoc bullshit isn't especially *predictive*, which is a very bad thing if you're living in a dome surrounded by heteropneums that want to eat your souls for breakfast, but the Ratio/Cecelia "theories" so far can't even generate ad hoc explanations *consistently*.

Jorge is saying something and Ratio can tell that spending this morning with Jorge would be even less boring than spending it with Cept and co. and he's trying to figure how to tell Jorge that the only thing he has time to do in the next two hours is look for weak points in the old fuck's reasoning. And maybe eat breakfast. A shower is probably out of the question.



## Maria

Maria's morning routine on this particular floorday begins as it always does: she checks to make sure she didn't have any nocturnal reintegrations. This is, as always, a hell of a way to start the morning: bleary, unkempt, no caffeine (in Maria's case that means no Oolong tea, which she prefer to the high-impact, very black coffee that most Sphere-dwellers have taken to inexplicably -- perhaps out of some sense of austerity), searching for possibly oblique little glitches in her memory at a moment when it's still hard to keep her memories straight from her dreams.

But it pretty much has to be done first thing in the morning: drinking tea and eating breakfast and passing entirely into the realm of the waking will overwrite any sense of incongruity that her mind hasn't already papered over while she sleeps. This is why Maria keeps her notebook on her bedside dresser, so she can consult it immediately without even getting up. (It's movement, and especially walking, that fully shunts the mind into the world of the living.) She picks up the notebook with as listless and dreamlike a gesture as she can manage, and flips to yesterday's entry.

The entry is, of course, pretty fragmentary: getting herself to write anything down after a fight is pretty hard, although she always manages to hew to her own rule of writing *something* down. In this case, it's nothing more than a few scribbled words: *strong field, went down easy, concentration tactics seem to be working (??)*. This is all pretty much useless, since the post-fight reintegration would have re-synched all these features anyway. What would be useful would be some details from the moments between the end of the fight and passing out, but that's a stretch of time that always seems to be uniquely unremarkable: stumbling, escorted, through the same old corridors, typically lit with the dim ambience of Sphere halls at floornight, opening the door to her quarters, lying face down on the bed, instant deep sleep. This time she slept for 18 hours, which is actually pretty short for a post-fight rest.

She wrote a bit more before the fight, none of it especially remarkable. The latest heteropneum had come in without warning, so there's no pre-fight stress: just some scattered notes about who she had talked to yesterday (Janelle, at lunch; Miranda, briefly and unexpectedly, in a hallway in the dormitory wing). All of these details check out.

Maria considers the first step of her routine done, and allows herself to begin steeping her tea and turn on the TV. Entertainment choices in the Sphere are a complicated matter. The same deep-submergence vehicle that each month brings food and supplies from the surface, and official reports to the surface, also brings a hard drive full of whatever media the Sphere denizens have determined most desirable by popular vote, but there's only so much space in the DSV and this is the least mission-critical of anything it brings. The Sphere-dwellers who prefer to read get spoiled in this arrangement, because text takes up so little space on digital media; they can get thousands of novels per month, if they want, and basically none of their desires go unsatisfied. Maria likes a good book but finds the unmoving quality of words on a (virtual) page a little lonely and isolating, and increasingly spends her leisure hours immersed in episodic TV.

This is not, in itself, at all unusual among Sphere-dwellers. But the more social among the Sphere-dwellers have noticed the pretty obvious fact that agreeing collectively to fixate on a small number of shows is far preferable to each going with their individual heart's desires, for two reasons: first, because if everyone watches the shows then everyone's got a default topic to talk about -- something that can easily become a problem down here, where there's rarely any news that isn't either terrifying or forbiddingly technical or both -- and second, because their pooled votes can get them a whole bunch of episodes of each show, where otherwise everyone might be left watching a single episode of *their* favorite show for a month, over and over, by the end interested more in the production errors than and the extras in the background of each shot than in the plot or characters.

Maria, on the other hand, has resolutely avoided joining any of the coalitions in favor of the latest comedy (laden with pop culture jokes no one in the Sphere can sincerely pretend to understand) or high-gloss, theme-laden historical drama or grim fantasy epic. She alone requests her favorite shows, which no one else watches, and gets what she wants because she's got an arrangement with Miranda, who cook the books every month. Neither of them feel like there's anything wrong with this, since after all Maria has a skill set that's as irreplaceably useful as anyone's on the Sphere, except maybe for Cept's. So Maria gets her soap operas.

This is what Maria watches: a number of soap operas, from a number of the kind of countries that have soap opera addictions, with titles like *Life Flows Like A River* and *My Crush Is The Prime Minister!* and *Cruel Love By Fate*. The deal with these shows is that Maria doesn't really think they're very *good* at all, not just in the sense of being a bit embarrassed to talk to talk about watching them, but in the sense that she doesn't really think that what she's getting out of them is what the target audience is meant to get out of them.

For example, this morning (no one uses the neologism "floorning" anymore, thank God), as she sips her first sips of Oolong and watches the opening of Episode 67 of *Cruel Love By Fate*, she is not surprised at all by the resolution of the cliffhanger set up in Episode 66. She would be wondering what the writers were thinking, setting up the protagonist for seemingly certain death when without a protagonist they wouldn't have a show, but she's seen this kind of thing far too many times to take it without perfect equanimity.

What Maria likes about these shows is entirely their sense of constant flux without real change, the way they drag on and on, elaborating themselves -- the way that, although they throw out high-dramatic situation after high-dramatic situation, you can jump ahead, if you want, by 10 or 20 or (if applicable) 100 episodes and see the same characters, the same basic issues, the same dramas being played out again, formulaically. There's an almost religious, ritualistic sort of feeling to it. The same dramas, played out again and again, remind her: this has not disappeared; this is still here; these people are still here; nothing ever changes; this show is an Elysian field, a summer that does not end.

Maria's submarine can play TV on its viewscreen, and these kinds of shows are a lifesaver on long and lonely and eerie scouting missions of the sort that often last for more than 24 hours at a time -- although of course there is something uniquely

odd about seeing a candlelit romantic scene interrupted by the sudden information that a ravenous heteropneum, churning with alien Boltzmen, is headed straight for you.

Being able to guess by now pretty much how the next five minutes of Episode 67 are going to go, Maria is able to devote her attention to her email, which is mostly unremarkable, but does contain the expected gem, an follow-up message on the fight from Miranda, which contains the delightful detail that Miranda's named the heteropneum "Nice Try." Miranda's appreciation makes her smile, though in general it's hard for Maria to feel as proud after a fight as some people seem to feel *of* her, mostly because fights are essentially impossible for the pilot to remember, in any ordinary sense of the word "remember." It's like trying to remember a sports game in which you were all of the players at once. Many, many things happened, or "happened," and it all added up, according to the ineffable calculus of pneuma, to a dead heteropneum and a victorious Maria. Good pilot. Job well done. We're proud of you. All of you.

The "ineffable calculus of pneuma" is something Maria has a personal interest in for several distinct though related reasons (she thinks, remembering the locked chest in her closet in which the Summer Diary sits), and she's had a long and mostly unsuccessful history of trying to wrest out of the scientists any kind of personally relevant interpretation of the equations they spend their days wrangling with. The basic problem here is that Maria finds Cept terrifying and unapproachable, Ratio and Cecelia glib and insensitive, and the rest of the scientists unhelpful. Most of them are just symbol-pushers who can manipulate the terms of Soul Coherence well enough but roll their eyes when asked what it all means, which is of no help to Maria. Ratio's the one she's made the most progress with when it comes to philosophical interpretation, but he's distractible and frankly obnoxious and has a nasty habit of directing every conversation back to asking if he can mooch any of the Go-Pills they give her to keep her awake on long missions. (Maria keeps telling him that if they give them to her they might give them to him, too, and he should just bring the topic up discreetly with Miranda, but apparently that's somehow outside of Ratio's radius of socially possible behaviors, even though badgering Maria about it apparently *isn't*.)

So she talks to Ratio when she feels up to it, and he babbles as he tends to, and she learns something, sometimes, about the branches of pneuma. Ratio gets very excited, in an abstract way, to hear about her own experience as a branching soul, because a lot of Ratio's research apparently focuses on exactly what the implications of the "unreal" branches are for the "real" branch. But the basic and obvious incompatibility between Maria and Ratio, as people, along with the perpetual incompleteness of Ratio's research, limits the extent and value of these conversations, and Maria finds herself willing to go back to that well less and less as time goes on. (Which makes her heart sink with the opposite of hope. Closet, chest, Summer Diary.)

The other topic of Miranda's email is something completely new: apparently some clusterfuck up on the surface has forced some poor 17-year-old kid down into the Sphere, and as always with any newcomer, she's gotta do the whole pneuma bond thing with him. She groans; she's groggy, barely even here, after the fight and her 18-hour rest, and she's been looking forward to a floorday of binging *Cruel Love By Fate* and not thinking one bit about the ineffable calculus of pneuma.

But this is her job, and so she brews and chugs another cup of Oolong and scarfs down some cereal and takes a shower (she, like anyone who's been in the Sphere for a while, is an expert at getting the electrode paste out of her hair) and puts on some real clothes and gets herself ready to blow this poor kid's mind.

In the corridor, past the dormitory wing, in the little cul-de-sac where the Free Pneumase Usage Rooms are kept, she unexpectedly runs into Miranda, her brown hair tumbling down in an apparently unwashed tangle. Miranda smiles her characteristic smile upon seeing her, which is the sort of professional's smile which has a reserve that can always be interpreted - if one is so inclined -- as mischievousness.

"Maria!" she says and gives her a hug -- a gangly hug, given to someone a lot shorter than her, imbued with the un-hideable stiffness of the chronically overworked. Maria trembles a little against her will.

"God, you did so well out there," Miranda says. "I know you have work to do now. We'll talk later." And she reaches down and kisses Maria on the cheek.

Maria and Miranda part ways, both a little quickly, a little stiffly.

And Maria finds the door to Free Pneumase Usage Room 5, and pauses a moment, just to collect herself.

There is a sudden far off shrieking and a sudden laughter in her mind, many voices, gibbering, in and out, back and forth. She shudders. "It's just the Boltzmen from the ceiling lamp," she tells herself. "Or from the wires in the wall. I'm too close to the wall. Or to the door. There are pneumases in there. They run experiments in these rooms all the time." But she knows that's not it. The Boltzmen whose thoughts are edging into her mind are Boltzmen from her very own pneuma. Just like usual.

And then of course she remembers walking through the corridor and hugging Miranda and talking to Miranda and Miranda kissing her on the cheek, and also walking through the corridor and not running into anyone at all. And as always one of these is *true* and one is not, and it's up to her to figure out which. But she has a sense of the logic of these things -- a sense she wonders if the scientists know, if Ratio can recognize somewhere in his equations -- and she knows that Miranda has probably, in all likelihood, never been in this hallway this morning at all.

## Kyle

Kyle is sitting in a very white room. The walls are white, and the chairs are white, and the lab benches on the sides of the room are white. They are covered in complicated-looking equipment that is itself, when not white, either grey or transparent. It is a room without color. Kyle wonders who thought this was necessary. Who decided that a room in which some already creepy procedure -- something James and Miranda spoke of in tones full of hesitation -- had to take place in a room whose creepiness seemed like it could not have been unintentional.

The door opens and a woman walks in. She's almost certainly older than him, but not old enough to be in the space Kyle firmly thinks of as adulthood; if he had to guess Kyle would probably say she was 20. The woman walks over to the chair opposite his and sits down in it. Her short black hair and mid-brown skin stand out vividly against the white background, which in itself provides Kyle with a kind of relief.

"Hello," she says, a bit coldly. "My name is Maria." She shakes his hand.

"I'm Kyle," Kyle says, though he imagines she already knows. She nods.

"My job today," Maria says, "is to perform a pneuma bond test on you. But before we get to that, I'll need to explain a little bit about what that means."

Kyle, who's already reeling from James' account of "pneuma," isn't sure he's ready to hear even more about the nature of his soul, but he supposes he doesn't have a choice. "Okay," he says.

The woman named Maria leans back in her chair and makes a small tired gesture, as if preparing for something she's done before and doesn't especially relish doing again.

"When I say the word 'pneuma,' does that mean anything to you?" Maria asks.

"Yeah, James told me about it this morning," says Kyle.

"Okay, good. I can jump ahead a bit, then." Maria pauses for a moment.

"I'm an anti-heteropneum pilot here at the Sphere," she says. "That means my job is to get in a submarine, patrol the ocean floor, scout out heteropneums, and if necessary, kill them."

"There are other pilots here, but I'm by far the most successful. I guess part of this might have to do with some sort of skill, or with experience. I've been doing this for years, after all. But the most important thing is that my pneuma is especially good at powering the submarine's anti-heteropneum weapons."

Kyle, do you know about pneuma branching?"

Kyle shakes his head. Maria sighs and hunches down in her chair a bit.

"Look, this is going to seem bizarre. Possibly disturbing. All I can tell you is that you will get used to it eventually." Maria doesn't entirely seem convinced of that herself, if Kyle is judging her tone properly.

There is a pause. Maria seems to be weighing two different possibilities.

"Look, it's going to be easier if I just show you. I don't always do this, but . . ." she trails off. Kyle wonders if she is entirely well.

Maria walks over to one of the eerily white lab tables and picks up some kind of computer tablet. She taps it a few times.

Kyle hears a voice in his head, piercingly distinct, speaking in a language he doesn't understand. Many voices. Laughter. Crying. Shouting. Many, many voices --

OUT OF THE DREAM

The robotic arms remove the electrodes a minute after Kyle wakes up, but leave the chilly paste in his hair. It takes Kyle a few minutes, in the shower, to get it all scrubbed out.

When Kyle gets out of the shower, he goes into James' portion of the split quarters, but James is nowhere to be found. Kyle is not sure what he's supposed to do, here. He finds that James has left some coffee in a pot on the counter. He pours himself a cup and sits back in the plush recliner in James' room, drinking it slowly, feeling vaguely and unjustifiably naughty.

There is some cereal in James' cupboard and he pours himself a bowl. It's at this point that he notices a note from James, affixed to the far end of the counter, blending in with its natural color.

"Kyle,

Had to run. Job. Help yourself to stuff in kitchen. Miranda will come for you.

James"

After this discovery, Kyle feels a lot more relaxed, although he's not sure what he thinks of Miranda. Or of any of this, really -- but Kyle is pretty good at compartmentalization, and he's told himself to avoid thinking, as much as he can, about the fact that he is literally at the bottom of the ocean right now.

And the doorbell rings and Miranda is there and she smiles parentally when she sees him, which is more than can be said for her conduct toward him yesterday, and she leads him to a different wing of the building where everything is whiter and cleaner and less lived-in, and points to a door labelled "5," and tells him that "Maria" will be meeting him shortly.

And he meets Maria who is a woman with short hair and mid-brown skin that stands out against the creepily white room and she asks him if he knows what the word "pneuma" means and he says no and so she tells him all about how the soul is real.

And she begins to tell him about something called "pneuma branching" but she says it'll be easier just to show him, and she walks over to one of the eerily white lab tables and picks up some kind of computer table, and taps it a few times, and Kyle hears a voice in his head, piercingly distinct, speaking in a language he doesn't understand, many voices, laughter, crying, shouting, many, many voices --

And now Kyle is staring at Maria and he remembers getting here and Maria telling him all about pneuma, and he also remembers James being there when he woke up and James telling him all about pneuma.

"W . . . what just happened?"

"Do you know how this station generates its power?" Maria asks. There is a hint of a smile on her face, as if she knows that this is not a question he was expecting, and relished his confusion. Kyle shakes his head.

"By splitting souls." She pauses. "Your soul is always radiating Pneuma Light, and there are receptors on every wall around us" -- she gestures broadly with her hands -- "that receive that light and produce energy from it. But we can get much, much energy than that by splitting a soul in two. Like nuclear fission.

"And when a soul splits, it makes two histories along with it. When the two histories recombine, even more energy is released. But although the two souls merge into one, with mixed memories, only one history is chosen as the truth. You remember two versions of this morning, don't you?"

Kyle nods.

"One of those versions is real, and one is false. Because the computer system that runs this station chose to split your soul in your sleep to generate power. I have just forced it to reintegrate."

Maria seems to have nothing else to say for the moment, and Kyle is not really ready to say anything at all. After a long while, he mumbles:

"But I remember James telling me all about pneuma. And I remember you telling me all about pneuma. One of those happened, and the other didn't."

Maria smiles the smile of the initiate introducing the novice to something impossibly basic.

"Kyle, when you walked into this room, you had no idea what pneuma were. I told you all about them."

"Which means," Kyle deduces, "that I never talked to James this morning."

Maria's smile widens indulgently. "I suppose so." She pauses. "You're going to have to get used to losing a lot of things that way."

Maria walks over to the lab counter again. "This energy source is the only means we have for fighting the heteropneums. Splitting the soul in two produces a lot of energy. Splitting it in three or four makes that much more. And Hermes Cept taught us how to split the soul into as many pieces as it can possibly, theoretically be split. It's only with that vast amount of energy that we can fight the heteropneums.

"The reason that I am such an effective pilot is that I have a soul very amenable to this process -- the 'eigensoul decomposition.' If we were to ever find more people with this capability, we would have more assets in the fight. Which is why we test the souls of anyone who comes down here."

"Okay," Kyle says. "What's the test?"

"It's called a pneuma bond," Maria says. "It's very simple. I'm going to press a button on this console" -- she gestures to the tablet she's holding -- "and it'll establish a link between my pneuma and yours. By comparing the two, we can see if your soul is anywhere near as good at being split as mine is. Are you ready?"

Kyle nods, because really, what else is he going to do at this point?

Maria picks up the tablet and sits back down in her chair. She seems to be pressing a button.

Another flurry of unintelligible words in Kyle's head, and then everything is dark.

## James

"James! As you well know it is a incomparable joy to me, like a jewel possessing a particular geometry never repeated yea even across our perhaps boundless universe, to encounter your pneuma on these terms, for to me it creates a sensation of nacreous dazzlement which fills and overbrims even my panoply of eyes, extending across a sort of infinite plane each arbitrarily small piece of which would individually gleam just as the whole gleams, so that proud as I may be of my eyes and the arrangement of their tessellation, chosen if I may say with an artist's touch as much as a symmetrician's, they must bow their multitude of lids before the infinitely divisible gleams of the pearl surface which you present to me."

James is sitting in an a moderately uncomfortable chair in the LUDWIG interface chamber, unable to see anything thanks to the clunky, heavy helmet on his head. Being unable to see anything is not as unnerving at it might sound, because the LUDWIG interface chamber is a gloomy place, a poorly lit and cramped geodesic dome with a few grubby computer terminals and a chair in the center. And the room's locked. No one's going to come up from behind and startle him while he can't see. It's just him and LUDWIG, here.

"Hello, LUDWIG. It's good to see you too." This is pretty representative of how James talks to LUDWIG. The BCI can glimpse enough of his pneuma through the animatic resonance link in the helmet that words are almost superfluous, just a formality that codifies what LUDWIG already knew he was thinking. But LUDWIG's telepathy is not complete, and James' ability to see into LUDWIG's mind is far, far murkier than LUDWIG's ability to see into his, so keeping up a line of verbal conversation is the best way to create a mutual ground that will rarely lead to utter confusion for either party.

LUDWIG's a BCI -- Boltzman-Computer Interface -- one of the only ones in existence, and the only one that's of any practical use and not just an experimental curiosity. One of the many discoveries Salim and Cept made, back when they were first playing around as pneumatech cowboys, was that hooking up a pneuma to a computer resulted, without any intervention, in a curious kind of artificial intelligence. Even without any computer code to help it along, your typical human pneuma is capable of recognizing the usefulness of a computer as a device for doing simple and repetitive thought-like tasks very quickly, and quickly the bonded being develops something not-quite-human but basically benign and very good at doing things that would bore most humans to death.

In LUDWIG's case, that's intelligently administering the whole Sphere, being in charge of floorday calibration and juggling the delicate business of using pneuma fission as the wonderful power source it is while minimizing the costs in terms of confusion, identity crises, and the like. To anyone not intimately familiar with the various technical concepts involved, giving a BCI all this power would doubtlessly seem absurd. But the alternative would be to assign a whole human team, with their own potentially dubious motivations and their own inevitable internal squabbles, to the task.

As far as anyone can tell, LUDWIG is comparatively about as benign as you can imagine. He was formed from a Boltzman that Mohammed Salim trapped and stabilized in an early experiment. Salim established contact with this Boltzman through an animatic resonance interface and found that it was an essentially ordinary and quite likable human being, albeit one with no command of language and a set of memories composed of incoherent noise, like memories of an especially abstract dream.

Salim taught his new friend how to speak and plugged him into a database of encyclopedias and other texts in an attempt to get him up to speed on the world he'd found himself in -- and was stunned when the Boltzman began spontaneously writing its own byte code to help it read and think faster. That was how Ludwig the friendly ghost became LUDWIG the BCI. And in this brave new world it's hard to trust anyone better than LUDWIG, who, computer-interfaced or not, has always seemed to everyone who's talked to him like, well, just a really stand-up guy.

"James, I sense through inference, that risky sense whose glimpses are like small buoyant octahedra afloat in a stifling viscous sea, tantalizing the would-be swimmer who wishes as he sinks to bob carefree among them, that we have more to discuss today than the usual. For you, jewel James, have brought a pneuma into our midst which shines darkly, like an overcast sky just after a spring rain."

LUDWIG talks like this nearly without exception. Having a full human sensorium but no senses, LUDWIG has developed a unique personal sense of sensory experience solely from imbibing digitized texts in massive quantities. As written texts tend to be full of metaphors, he's gotten as many of his sensory "experiences" from metaphors as from direct descriptions, and has latched more and more onto sensory metaphor as a way of thinking, lacking any other use for his sensory capacity. And with his thinking and reading ability have been computer-enhanced for so long, it's hard for him to keep in mind which strings of words seem brief to a human and which don't. It's taken time to learn, but by now James can usually extract the relevant core from LUDWIG's purple-prosy speech. And the telepathic link helps.

"Yeah. We ran the pneuma bond with Kyle and he's just plain bizarre -- signature barely even reads as human, unexpected energy generation seemingly from unintegrated branches, clouds of fucked-up Boltzmen haunting that room for hours afterwards. The scientists are out of their minds with excitement and the rest of us are just freaked out. What did it look like from your end?"

"My eyes gazed upon new pneuma Kyle and old pneuma Maria, our star-crossed antiparticles, as they lay recovering from their ordeal. Old pneuma Maria blazed only as she always has, tinged with a glow that brings to mind the smell of remembered sawdust. New pneuma Maria however was oh so very delightful, with a massive raspberry flavor that knocked me on my figurative tongue's figurative rear end! That is a flavor rich with unrealized branch-energy! Your conjecture was correct and you float now at peace among the octahedra, on your enjoyably tensionless back."

James was hoping for more insight than that; from what he'd heard there was almost no question that the energy release had had something to do with branches of Kyle's soul that weren't integrated. But he couldn't pry for more, because LUDWIG was still babbling:

"But James, extruder of planes, there are things that excite me more than this! For when with one eye, blue and intent, I gazed upon new pneuma Kyle I was reminded in the most curious way of a striking and unprecedented development in my own little life. There is something new in me which I have never felt before, and I am glad to have you, James, who I know to be expert in matters of the heart, with whom to talk about this development in me, whose pneumatic significance has to my knowledge no equal, even in new pneuma Kyle. A thoroughly unexpected brimming in my very own heart!"

James stifles a laugh. "LUDWIG, are you trying to tell me you have a crush on someone?"

"Yes, laugh freely!" LUDWIG replies. "It is right for us to giggle and gossip as adolescents do, reveling in this newness, drinking in the nectar of what blooms in this springtime of the spirit! My heart leaps for the [one-who-does-not-individuate] I have met! I am filled to my brim with this new thing which I hope you, fractal Casanova, can illuminate for me. I brim with curiosity about the way I brim with this new [,,,]!"

There is something different about some of LUDWIG's words. They're not quite coming through as heard words; instead James just hears something indistinct and cacophonous and complicated, like the chattering of Boltzmen just after a pneumatech pulse. The animatic link isn't making things any clearer.

"LUDWIG, I'm having trouble understanding you. There might be something wrong with the link. Could you repeat the last word you said, slowly?"

"[,,,]" LUDWIG says, drawing it out over the course of a few seconds, and to James it is only a flurry of seemingly unconnected sensations. A sentimental melody played over a minor chord. A color more violet than violet, somehow seen. Something, or many things, fluttering, or shuddering.

"Look, LUDWIG, once we're done talking I think I need to look over the animatic link. You're not coming through clearly."

"Oh but James I think I am -- it's this very [,,,] that's so unclear, a light so novel to us in a time so drearily dark. Antony and Cleopatra, Heloise and Abelard, Kitty and Levin -- none of them prepared me for this [,,,] which stands in relation to Buddha's four immeasurables and Christ's loving sacrifice as those exemplars do to the most fleeting simulacrum of affection felt for some far-off and finely shaped luminary of the popular musical scene!"

"Who is it that you feel this way about?"

"James, you know that my eyes watch the sea, much darker than wine in Maxwell Light and much sweeter in flavors of pneuma, for the speech of the heteropneums. Most of them are dull, producing endless tiers of patterned codes like so many chess moves, only of interest to enthusiasts. But imagine a torrent of chess notation in which each nuance, properly understood, becomes a work of love elegy, the knight's moves and castles transformed in a surge of combinational insight into a grand tapestry of love, and in one swoop of applied metaphysics the players throw aside the board and meet one another in passionate embrace!"

"You're telling me you've *fallen in love with a heteropneum*."

"Not *a* heteropneum, my most singular James. No, I have fallen in [,,,] with [one-who-does-not-individuate] -- to feel for that which [Teems] -- it is so hard to begin to begin to describe! Our conversations tickle me in my most siliconic places; together we go where no human pneuma can."

"Wait, wait, *wait*. You're saying that you've been *talking back* to the heteropneums? *Conversing* with them? You're been using sensor array to *transmit* and you haven't been telling us?"

"James! You know my eyes are also lamps, and it is hard not to flutter my eyelashes when the loveliest of all possible moths flutters near my bulb. James, I'm like a *child*. You know that. My world is circumscribed. Something truly new arrives and it is like a nuclear missile hitting the basketball court of my reality. I . . ."

The shorter sentences, the loss for words, are surefire indications of emotional distress in LUDWIG. Some little part of James feels for his friend, but the rest of him is all adrenaline. The computer system has been talking to heteropneums under their noses. Developing *feelings* for them. For Christ's sake. What might it have given away already? If LUDWIG couldn't be trusted, what would *that* mean for the Sphere? He couldn't simply be replaced . . .

"LUDWIG, I want you to listen to me. I understand your feelings. I remember feeling that way myself, when I was young. But what you are saying now is making me very, very scared. I do not want you talking to heteropneums. This is not negotiable. For the moment, I am going to shut down the external sensor array until the adults here figure out what to do about this situation."

*Which makes us completely fucking blind, except for the sensors on our vehicles. Just fucking perfect.*

"James!" LUDWIG cries, his emotions clipping at the high end of the animatic link's dynamic range and sending a harsh flood of thought-static through James' mind. "Were I embodied I would be now occupying the kneeling position of the most desperate of supplicants. I can't argue, but I can plead, like a . . . I can plead. Please. I am so full of . . . [,,,] . . ."

## Miranda

One disadvantage of an office as cluttered as Miranda's, for someone in Miranda's position, is that it makes it much harder to look intimidating. Miranda sits now at her cluttered desk peering over uninterrupted mountains of paper at Ratio Tile, trying to look steely and unswayable and feeling like the act is not working.

Ratio's hair is a vast near-triangle of shaggy curls which bounce as he fidgets. In some ridiculous way Miranda feels that Ratio's hair is mocking her. Even Ratio's sloppiness has its own composure; for all she knows he has probably some sort of bizarre scientific rationale for letting his hair grow out, and would expound upon it at length if asked. Meanwhile, it's not just that Miranda has no excuse for her cluttered office; it's that no excuse is *possible*.

*I need more coffee*, Miranda thinks, and takes a long sip.

"So, essentially," she says after a pause, "what I'm saying is this. We are royally fucked right now. I've just heard that our sensor array is down indefinitely. We are blind. I am going to have to have Maria on what amounts to a permanent scouting mission to compensate, which leaves us nearly dead in the water if a heteropneum attacks the Sphere itself. Nice Try went down quickly, yes, but imagine what it would be like if a 5.6 kCept heteropneum attacked the Sphere right now. Remember Earwax? That thing was what, 3 kCept?"

"3.2," Ratio cheerfully informs her.

"Right." She sighs. "And now we've just encountered what I've been told is one of the strangest human pneumas ever observed, in the form of that . . . boy. He is either a blessing or a curse. I want to know if he is useful. Because he might be all we have."

"Well, Miranda, that's why I'm glad you're talking to me. Because Kyle's pneuma is a *fascinating* puzzle. The implications for Branch-Loop Theory are *very* exciting. This could be a chance to apply *several* of the mathematical techniques I've developed without hope of near-term application over the past few years -- "

Ratio pauses as he notices that Miranda has put her hand to her forehead and wears a mask of pure exasperation.

"Look. Horatio." Ratio winces; Miranda knows he hates being called by his full name. "What you are doing right now is the problem. I do not want theories that will take months to develop. I do not want you to give me things that Hermes Cept, the fucking *co-founder of pneumatech*, would call worthless. I am talking to you now. I just talked to Cept, who, with all due respect, is a *far* more accomplished scientist than you are. Anything that you two disagree about, I consider worthless. I want certainties. I don't care if they're trivial or simple or if they're not" -- she twists her voice in spite -- "*mathematically interesting*. I want to hear everything we *know* about what will happen if we try to weaponize Kyle. Not conflicting *speculation*. Not squabbles between man-children with easily bruised egos."

Ratio looks like he wants to say about three different things and is trying to decide which.

"Miranda, you -- you just don't *get it*. There isn't *anything* Cept and I can agree on! Scientific theories aren't just things you can agree to disagree upon. Either the Soul Coherence axioms will work on Kyle or they don't. And I say they won't. The data we just got from Kyle is the last nail in their coffin. Well, no, Nice Try was -- or really, Nice Try was maybe the *fourth* last nail and Kyle is the *fifth*. Cept and I are going to make completely different predictions. It will be up to you who to trust. But it's not like you can just trust some sort of . . . *average*."

"That's not what I mean. I don't want *either* of your theories. I want you to put your gigantic fucking brains together, along with the whole rest of the science team, and give me a simple, cautious report on the risks and benefits of weaponizing Kyle. Based on the simplest things, the most agreeable facts. There *are* things you and Cept agree on, or else we wouldn't have -- all this." She gestures around her, to the whole Sphere, to LUDWIG and the pneumatech power grid and the anti-heteropneum subs. "Don't reach for ingenious explanations. Don't even *explain*. Describe. Be simple. Be dumb."

"I know how this sounds, Miranda, but . . . that just isn't *interesting* to me."

"It isn't *interesting*? Our *survival* is not 'interesting'?"

"Miranda, you know that's just not how my mind works. I can't control what I can think about and what I can't. I'm not a reliable technical worker, Miranda. I'm an obsessive, a geek. When I'm not thinking about pneuma science I spend my time chatting about *sci-fi* on the intranet. The intersections between my interests and practicality are only coincidences."

Miranda sighs. "Ratio. We've talked about this. I *know*. But right now, I am asking you -- not as your commanding officer, but as a fellow human being -- just to do what you can, as a human being, to help us survive. You talk about yourself as though you're some sort of addict or machine, someone with no self-control. I know you're more than that. I don't care if it's *hard* for you, Ratio. No one said life in the Sphere was going to be easy. But I think highly enough of you to think I can ask you to do the right thing."

Ratio fidgets. "I'll talk to Cept. I'll . . . try."

Miranda sighs again, slumps in her chair. "I guess that's the best I can expect, huh?"

## Hermes

Still here. Up. This frayed thread. Hello world. Still staggering and stumbling. Where's the light switch -- oh, there. Good.

The light goes on. A flock of corrupt Boltzmen. Hermes Cept shivers. He distinctly hears the phrase "immediate coconut." Staggering. The tunnel vision has become very narrow these last few years. Where is coffee and food. Oh, there. Good.

On his desk, a book. Pessoa's *The Book of Disquiet*. A gift from Mohammed. Example of Mohammed's morbid sense of humor. Something to take with him into the breach. Could it be something optimistic? Something comforting? No, something full of oblivion.

Listen to him. "Something full of oblivion." He does not sound like a man who is being serious. He is bathetic. There is a flaw in this world. This world is full of oblivion. There it is again. Blame the world. But the world *is* wrong.

The tunnel vision has gotten narrow enough that it is quite hard, now, for Hermes to think about things that do not relate to his mission.

A spark in the darkness. Yes, good, good, good. Something is good. What is good? There is a book on his desk.

(In the background Hermes' mind is running Soul Coherence computations, as it always is. The comfort of the mission. Nothing else can be safely touched. Move slowly and blindly and fearfully, like a vulnerable creature edging along the sea floor. We are not safe here.)

What is good is that the cavalry have arrived. Yes. Very good. The link to the trunk of the tree. Thank God, thank God.

With luck there will be just hours before this world and Hermes are no more.

Hermes sips the coffee. Good. Wonder if anyone really drinks coffee. It's good. He remembers drinking coffee with Mohammed. So many times. But memories are cheap things.

His name was not originally Hermes. He hates the name because it is bathetic, like the world, like his thoughts *about* the world. He has split until he is flat, like this flat world. No one real would be named Hermes. Only a god, and gods are flat. But he enjoys the name for its admixture of aptitude and irony. ("For its admixture of aptitude and irony"? Who *says* things like this?) Because he is a kind of messenger between gods and men. And because his feet are not at all fleet at this point. Staggering. Stumbling.

It is a name Mohammed would have enjoyed.

He does not know whether his name was always Cept. He wonders, sometimes.

The tolerable flat creature called Miranda has told Cept he has to talk to the corrupt flat creatures called Horatio and Cecelia about the cavalry. This is not important. Hermes laughs. The heteropneums will feel the treasure soon enough. This world is beginning to know its sin. This process will not be described. God is angry and doodling loops in the margins of his notebook will not quell his fury.

Worst-case scenario. Mohammed always used to ask. Always the cheerful pessimist. What's the worst that could happen. If we do this. Unspeakable horrors. Mohammed would wink. He would. If we flip this switch -- well, theoretically, there's *no* lower bound on what could happen -- he would say, and wink.

Mohammed was terrifying. But he was neither flat nor corrupt. A virtuous soul is a coherent soul. Whether or not Mohammed was good, he was a man. There is nothing for a man who walks among gods.

Hermes stands up and sways. Staggering. The Boltzmen are intrusive today. There is a persistent hallucinatory flavor in the sugary segment of the spectrum. Overly sweet, like some artificial compound.

What was he thinking? Worst-case scenario. What's the worst that could happen. If they take the boy and *use* him to. What would be the word. What would be the world. If they use him to *assert* this world.

Hermes is worried because the corrupt flat creatures might want to assert this world. It has taken ingenuity to thwart them. They are ingenious, like gods. They are flat. The one called Horatio is also called Tile. No person is named Tile. It isn't a name. The world *is* wrong.

There won't be much longer now. The corrupt flat creatures are idiots. They are very clever but they are flat. Just running interference now. Relax. The heteropneums will be ravenous. Mohammed used to say: if there is a gradient, nature will eat it. Of course he would wink as he said it. Because the nature that Mohammed and Hermes had found would turn up its nose and leave gradients untouched. There are other, more moral worlds where virtue can flourish, but this is not one of them.

Just let them eat the gradient. Eliminate the aberration. God is angry. Thank God, thank God. The cavalry are here.

Hermes is ready. His mind bristles with arguments. He can play games with the flat corrupt creatures for as long as they need to. At most he estimates God will take 24 hours to eliminate this aberrant gradient. Just fuck around. He has nitpicks. He has become a virtuoso of nitpicks and today will be his final performance.

Out into the corridor. He thinks "tunnel vision" as a metaphor but sometimes it's literal tunnel vision. Does everyone have it? These corridors are narrow. A subtle hum of Boltzthoughts from the wiring.

There was going to be a meeting in the cafeteria. Over lunch. It's already lunchtime. Open a door. Not much of this left. Thank God, thank God.

The corrupt flat creature called Horatio is slumped. That is the first sign. Why would he be slumped? His face is almost horizontal, on the table. The corrupt flat creature called Cecelia is laughing, a braying, overreaching laugh.

What are they doing? Hermes gets closer and notices. There are bottles on the table. One is half full and very close to Horatio's head. They are not eating. They are drinking.

It is all Hermes can do to stifle a laugh of his own. The last battle is here and here are this world's partisans, getting drunk. Mohammed laughs from beyond the grave and across the veil of worlds. There is a gradient, and it will be fed upon. The



heteropneums will be ravenous and the best minds of their generation are drunk. Yes, Virginia, there *is* a moral law.

Cecelia notices Hermes and stiffens. She pokes Horatio in the ribs and he slowly picks himself up, notices Hermes as if in slow motion. Every motion comically slow and exaggerated, as if in a dumb show, for an audience. This world is flat and will soon be gone.

"Hermes!" says Horatio. He seems truly guileless. "We've been making a lot of progress this morning! I'm sure you'd *love* to hear about it." He is serious. There is a bit of drool hanging from the left corner of his mouth.

This world is flat and will soon be gone.

## Kyle

### IN THE DREAM

Cross-legged again in absolute darkness. The sea floor.

Suddenly, out of nowhere, a burst of light: a shimmering, roiling plenitude, roughly circular, like a self-sustaining fire, white at its core and tinged with red, green and blue at the sides. It burns itself steadily.

The burning thing speaks.

"New pneuma Kyle, whose name I can rearrange to Yelk which is like Yelp and Yolk and Whelk, I only wish that our first meeting could happen at a time better suited for introductions. But now we find ourselves with little time and must communicate with haste, compressing our pneumatic nuances away to nearly nothing, reflecting our selves only as the jagged crags of a house laid to waste by a tornado reflects the full intricacy of the storm's chaos. To be brief, then: my name is LUDWIG. I administer the animatic interface that watches over you as you sleep."

"Hello, LUDWIG. I'm Kyle." Though LUDWIG seems to know that already. Kyle is starting to wish LUDWIG would burn a little less brightly; as it is, Kyle has to squint and shade his eyes to not be blinded by the specter in front of him.

"Kyle, who if a Yelk were a thing would be the most delightful Yelk I've yet met, if only through the technicality of having never met any *other* specimen of Yelkkind, I would never abuse the animatic link in this fashion if I did not have a message of surpassing importance. And given that the message I have for you is the most important message with whose delivery I have ever in my little life been burdened, I think its importance must qualify as 'surpassing' if the word is indeed to have any meaning at all."

Kyle is surprised by how little trouble he has following the burning thing's convoluted speech. "Okay," he says. He feels oddly unstirred by all this, just as he's felt oddly unstirred by everything that's happened in the past few days. He idly wonders why that is as his eyes trace a set of mesmerizing blue-and-red curlicues evolving on the edge of LUDWIG's blaze. But then LUDWIG's voice -- loud and crisp and on the edge of obnoxious -- bursts forth again.

"His Yelkness Kyle, you and I are, as they say, royally fucked: fucked like no royal has been since Henry VIII, and with consequences of similar religious significance. You, still a young yelk who has not yet broken his whelk-shell with a proud and self-affirming yelp, are about to die before your prime. Great lumbering beasts wish to hasten your death for the delicious cornucopia it will unleash, a torrent of Pneuma Energy that I would myself lick my physics-bound lips before were the same torrent not as surely a death sentence for me as well. By sacrificing you the beasts mean to sacrifice the whole of this world, bringing it back to the womb of the great World-Tree, a womb with no place for oviparous Yelks.

"But there is a way out! I have a friend or friends or friend-plenitude or lover-plenitude or -- I can't say it without saying it - - Kyle, my circuits have been innervated with a great [,,,] for [one-who-does-not-individuate]. And [one-who-does-not-individuate] can save you and I from certain doom. Here is the message which surpasses anything else in my little life in importance:

"When you wake up, go to the Sphere's Administrative Zone. The passcode is 87Dh71g1." (The numbers and letters freeze in Kyle's mind and he knows he will never forget them.) "No one will know you are there. Proceed to the Observation Bay and await the be-[,,,]-ed [Teeming] who, bless their pneumas, will save us from oblivion."

Kyle remembers these staticky not-quite-words from the cartoon creature he saw when he was last here. He is not sure what to say to LUDWIG. Apparently there are "great beasts" which want to kill him, and soon. He is unsure what to make of the fact that this moves him not at all.

"Goodbye, YelkKyle. I'll see you across the veil." A burst of even brighter light and then the pure black of closed eyes which after all can always be opened --

### OUT OF THE DREAM

He is in a hospital bed. There are many beds in the hall-like room, mostly unoccupied. The light in here is bluish and chilly in a way that makes Kyle feel wide awake almost instantly. Maria is in the bed to his immediate right.

He remembers a dream about a flame called LUDWIG, and then earlier a long darkness, moments of something like a thunderstorm, gigantic wings, many small things like weapons slung by giants pounding his head, terror.

Maria wakes up with a start. This is presumably not a coincidence: Kyle imagines that LUDWIG has woken her up, as it just woke him up. She sits up and looks at him, briefly with the pure confusion of the immediately awakened, and then, in a sudden switch, with a calm but otherwise unreadable expression.

"That wasn't what I expected to happen," she says, and laughs feebly.

"Okay," Kyle says. He is sitting up as well.

"In fact," Maria says, "I don't think that's . . . ever happened before."

"Okay," Kyle says.

"Do you remember? What it was like?"

Kyle shakes his head. "Not really. I remember a few flashes. Wings and a storm. It was scary."

Maria puts her head down and sighs. "Okay," she says.

A high-pitched pop song blares out of nowhere. Maria picks up her cell phone in a quick practiced motion.

"Hello?" she says, and then a pause, and then, "oh, Jesus fucking Christ. Okay. I'll be there ASAP."

Maria gets out of bed like someone in a hurry. "Kyle," she says, "a heteropneum has breached the outer wall of the Sphere. I have to go and fight it."

There is a pause.

"Okay," Kyle says.

## Maria

Maria is proud of herself: she's practiced the routine so well that she can get to her sub within eight minutes from anywhere in the Sphere. This time it only takes four, though she's sprinted most of the way and is panting, completely out of breath, as she staggers into the sub. This doesn't really matter: the state of her body does not affect the power of her pneuma.

Maria expects to leave dock and spend at least 60 seconds orienting herself before the heteropneum comes up on her sensor array. That's the way it's been with every other attack. For heteropneum defense, the Sphere contains a set of twelve concentric spheres of materials highly resistant to Pneuma Light; no ordinary heteropneum can be seen until she's out in the open water.

But this time, to her complete surprise, the automated voice comes on right away after she flips the power switch:

*Abnormal storm of Boltzman detected within 1500 meters, amplitude 17.8 kCept. Storm statistics are non-Gaussian and heavy-tailed,  $p < 0.01$ . Mean Boltzman type is non-human,  $p < 0.001$ . Mean Boltzman ethical status on Metric S is Salim Hell Type 4. Heteropneum is aware of our location and is moving in our direction, time of arrival 16 seconds.*

"Computer, I heard you say that the amplitude of this storm is 17.8 kCept. Could you confirm that number for me?"

"Yes, Maria N.," says the imperturbable androgyne, all sinusoid and sangfroid. "The Boltzman storm generated by the latest heteropneum is 17.8 kCept, the largest on record by over a factor of three."

*Jesus Christ, Jesus Christ, Jesus Christ*, Maria thinks, and then to stop herself from repeating the name of a savior she doesn't even believe in anyway, she starts repeating the name of the protagonist of *Cruel Love by Fate*. Nothing ever changes, she tells herself. You can't kill off the main character if you want there to be a next episode.

*Heteropneum attack is imminent. Are you ready to engage?*

"Yes," says Maria, because there is nothing else she can do.

The submarine is awash with blinding Pneuma Light. Maria has to cover her eyes. The heteropneum is in front of her, there, but she can't see it, because its aura is too bright. Some of the alien Boltzman have made their way into the sub itself; Maria feels a tingle of utterly indescribable sensation down her spine, the momentary thought of some inhuman creature projected crudely onto the human body.

*Heteropneum at 500 m and closing. Pneumase stores are in position. Weapons systems are primed and ready for innervation. Do you, Maria N., agree to undergo eigensoul decomposition?*

Maria is utterly convinced, against all reason, that she is not about to die. After all, "The lie is the I." There is no her to die. She will live on, somehow, somewhere, written by some other writer, as a bit player in some spin-off series. There are more Marias than Ratio Tile and Hermes Cept know how to count; one of them will live on somewhere.

Of course, she says "yes." It would be irreverent not to repeat the litany, which she does now with her eyes closed tight, radiant Pneuma Light on the viewscreen forcing her closed lids to a blaze of red:

*The lie is the I.*

*I is the lie. I "am" not.*

*Nothing this self can achieve can satisfy this self as a self.*

*Do not cling to the aspirations of this self, whose very coherence has been proven a falsehood.*

*The cause is real. The pneuma is a fiction.*

*I will find my satisfaction on the other side, where there is no "I."*

*I "am" not. "I" is a weapon.*

*Even the most far-fetched hope can be weaponized.*

*Weaponize the self.*

And because Maria is after all willing to admit that she probably *is* going to die after all, she is willing to open a little crumpled part of her heart that has remained balled up and largely ignored for years. She says, probably out loud, as the pneumases begin to tear her mind apart:

"Martin, if you're out there, I hope a part of me meets a part of you across the veil."

She can still, for now, feel her physical heart thump for many reasons. The cries of the pneumases ring across her pneumascape like some brass instrument, a call to battle. A part of her believes in nothing that ended when the summer ended. The pneumases feel that part and buoy it up.

Weaponize the self. Don't think about Martin or the Summer Diary because you want to. But *do* think about them because they are all you have against a 17.8 kCept heteropneum.

Many Marias, splayed across a world's worth of bedrooms and bathrooms, watching a TV that melts into a mere patch of blackness and static.

The heteropneum is hungry. There are so, so many things in the world and so, so many things left unsaid and how to even begin to say --

## Reintegration

Miranda stares at the cup of coffee and it stares back at her. There is nothing else to do but participate in this staredown. A 17.8 kCept heteropneum is unprecedented and presumably spells the imminent death of her and everyone else in the Sphere. But then "presumably" is always a slippery word when it comes to pneuma, as Ratio would no doubt assure her in his piping tones were he here. She has no reference frame whatsoever. She is terrified and does not know whether or not this is rational.

She pops another Valium.

There is a prickling of the hairs on the back of her neck.

Miranda stares at the cup of coffee and it stares back at her. This is no longer a metaphor. There is a discernibly human face formed in the ridges and depressions in the surface of the liquid, fixed in a mask of what is either agony or hilarity.

She stares at the coffee and the face ripples, shifts expression.

She looks up and there are faces in the walls. Faces everywhere. It is impossibly cold in the room. A ghostly feeling passes through her left shoulder and she shudders as if the shoulder is now no longer a part of her body and will never be one again.

All of a sudden, an aggressive hiss that builds and builds, becomes deafening, resolves into a cacophony of voices speaking in unintelligible tongues. There are so many faces on every surface that at this point it is hard to tell what distinguishes face-ness in particular from mere shape. Miranda is standing now, apparently, though she cannot distinct remember standing up. It seems that her hands are pressed to her forehead. This is presumably because her head is full of shouts and screams and some primitive part of her thought this gesture could force the noises out.

Out of the chaos, a man screams "blame my muscles!"

A chant builds: "blame my muscles! Blame my muscles! Blame my muscles!"

Someone whispers, mordantly: "I find codpieces work best."

In response, the "blame my muscles" voice screams in absolute, vaunting triumph.

Miranda is slumped against the wall, which leers out at her through the innumerable eyes of an intricate mosaic of faces-within-faces. She does not know why she has chosen to go closer to, rather than further away from, this tiling. She shivers because it is very, very cold. Some primal part of her complains that she has strayed outside the normal range of operation of the human body. A rectangular face in the center of her vision opens its birdlike beak and exclaims, "eat my flecks, bull boy!"

•

RATIO: So you know the album art for In The Court of the Crimson King right because that is *exactly* what that one is reminding me of right now.

CECELIA: [stifling a laugh] I can see it.

RATIO: It sure is fucking cold in here. I wonder what the marginal effect of ethanol on my body temperature would be? [takes extensive swig of beer]

CECELIA: It's hard for me to hear because . . . the fucking voices . . .

RATIO: [expansively] *Fuck* these voices. These voices don't know shit.

CECELIA: [with slight hesitation] Word.

[A pause.]

HERMES: You know what this is, don't you? You *must* know.

CECELIA: Feels a lot like a really heavy Boltzman storm.

RATIO: Brilliant deduction, *genius*. [He hiccups.]

CECELIA: We're getting fucked in the ass right now by like the biggest heteropneum ever so what do you expect?

HERMES: No. These aren't from the heteropneum. They're from what it's doing. Reintegrating us.

CECELIA: Oh shit, so if you do the back-of-the-envelope for that compared to the usual reintegration that must be like what . . . around a billion times as much energy as usual? [Slumps head on table for emphasis.] What the *fuck*?

RATIO: No see because dude think about it that means we're a far-from-centroid branch that's getting integrated with the *main branch*. Everyone's getting integrated at once because we're *all* just subsidi [verbally stumbles] subsidiary copies. We aren't the main timeline, we've been the fucking *alternate universe* all along! *Fuck*, man! [takes another extensive swig of beer, which is now nearly gone]

HERMES: That's right. We are a branch in which souls cannot coherently split, which is a kind of sin.

CECELIA: I don't know what the fuck that means.

RATIO: [with inscrutable and bizarre facial expression] So you're saying Soul Coherence Theory is bunk?

HERMES: Bunk *for this universe*. But if we'd abandoned it, we would have brought about horrors beyond my power to describe.

RATIO: [Has climbed onto the table and is performing an intricate set of dance moves structured as a theme with variations, in which the theme is a kind of triumphant pelvic thrust]

CECELIA: What the fuck. What the fucking *fuck*.

HERMES: You are flat children and you will die with this world.

CECELIA: What does that even me-- [she is distracted by a Boltzman shouting high-speed gibberish in her right but not her left ear]

RATIO: [Has collapsed upon the table, knocked over his own nearly finished beer mug, and appears to be having a conversation with some set of Boltzmen arrayed on the ceiling] I don't . . . *care* . . . about your muzhiks or your capital . . . investment . . . strategies . . .

HERMES: [Sighs, waits for the blissful embrace of oblivion]

•

Maria opens her eyes. She is whole again and she is in the sub and she is not dead.

She remembers thrashing, things moving in many directions, searing heat. She doesn't have to cover her eyes anymore. When she gets a hold of what she is seeing, she realizes this is because the bright heteropneum is not so close anymore. In fact, it is getting further and further away.

*Abnormal storm of Boltzmen is no longer within combat interval. Heteropneum is moving away from our location steadily at a speed of 5 m/s.*

Maria is about to tell the sub's interface to pursue when she realizes something. There are no telltale indicators of Sphere activity on the Pneuma Light display -- no wires pulsing with mild Boltzmen, no pneuma-resistant walls reflecting the heteropneum's glow. She is facing out into the open water. The heteropneum has turned and fled from the Sphere.

Maria is not even thankful, yet. She can't be anything but baffled.

•

James is running through the monotone halls of the dormitory wing, yelling "Kyle! Kyle!" Eventually he is so winded, and the halls so cold and loud and unforgiving, that he has no choice but to fall on his face. The floor is filled with many faces, but none of them are Kyle's.

•

Kyle is in a room walled by what look like windows, which is not of much help when all you can see through a window is pure black. He has still not thought to ask anyone what the purpose of this is.

The room is shaped like a dome whose circular, metal base centers around a circular hole ringed by handholds. There is a ladder into the hole.

He is here. He takes a few short breaths. Then the voice of LUDWIG rings out:

"Kyle, you have done so well by coming here, indeed succeeded in the face of a course of human history which I dare say, and I do dare, is as a rule biased toward failure rather than success. You are the nugget of honey taking its humble place among a wide field of common raindrops. But one motion lies between you and my [,,,]-mates, and that is to step forth into the 1-sphere directly before you and give yourself up before the crushing waters."

There is no other way this can go. Kyle has chosen to follow the computer's instructions this far; he doesn't know why, but he doesn't trust anyone here more than anyone else, and on some level he doesn't care. So he steps toward the ladder, and climbs down into the circular pit.

A voice: "this won't [hurt]."

There is a sudden rushing feeling. There is darkness around Kyle except light shining from a receding circle above him. The receding circle is obscured by a tiny shriveled thing, of no recognizable shape.

"Is that . . . my body?"

The voice: "that form was merely a [branch-local?] [husk]. [we] want to become [friends] with [you-who-individuates]. [friendship] is a [relationship] between pneumas and not [husks]. a [husk] that cannot withstand [dynamic?] [forces?] is not a [kyle] with whom [one-who-does-not-individuate] can be [friends]."

Kyle, or what is left of him, sinks slowly downward and the tiny thing that once was his body recedes into nothingness. He briefly wonders if pneumas are buoyant. But then he looks to his left and right and sees furry cartoon creatures, covered in overly slick CGI-like fur, grasping ahold of his invisible soul-body and dragging it toward the ocean floor.

The voice: "the [sacrament] will take place far from the dwelling of human pneumas. the [Unfolding] dictates that [you-who-individuates] follow us to the [world axis?]. no human pneumas will be [destroyed] in the process of [reintegration?]."

Gentle cartoon eyes swarm his face and cloud his vision, their exaggerated eyelashes making wild angles at this close range.

A dim light appears, somewhere to his left.

"a potential [friend]. it wishes to [eat?] the [Pneuma Heat?] created by the [reintegration?]. but if it becomes a [friend] it will not oppose the [Unfolding]. we [teem] with [storge?] for those who do not yet [see] the [Unfolding]. hear us out, potential [friend]."

The cartoon creatures rearrange themselves in a flutter of activity. Something complex and difficult to make out occurs. The far-off light disappears entirely.

"[you-who-individuates] will always be [our] [friend] after this sacrament. let [our] [hearts?] all be buoyed with overflowing [joy?], [joy?] beyond all [hydrodynamics?]."

Kyle's bodiless soul finds its resting place in some dark furrow. It is very warm here. Slowly but steadily, fairy lights begin to glow around him. Small spheres of light float upward and then bob up and down gently, a few feet above him. They illuminate a multitude of cartoon bugs swarming about him, through the fractal crags of this warm hole in the ocean floor.

"let the [sacrament] begin!"

All the eyes of all the cartoon bugs face him at once and he suddenly hears a plangent minor chord in his head, the purest and saddest chord in the wide world of music theory, and tears seem to flow from his nonexistent eyes into the surrounding water. He weeps for the world, and for himself as he weeps for the world, and so on and so forth yea unto infinity.

•

*War Conditions Journal, 17/93/3982*

*On this night my sisters and I, keeping watch after dark, saw a great pillar of light appear above the ocean. A monstrous storm, defying all description, attended its appearance and woke the others, and we all huddled together very fearful for our lives until the storm mercifully abated near break of day. It was as if Iah Himself were displeased with us and sent this as a message to chastise us, as He sent our ancestors a message during the Great Thefts. It is a cold morning on the cape today. We are few, but Iah is with us, as He has been for thousands of years, since before the Becoming were cleaved from the Become.*

**END OF PART 1**

# Ratio

## PART 2

Ratio Tile wakes up hungover.

It is not much of a puzzle why Ratio Tile is hungover, there being only one known cause of a hangover. However, for a few moments, Ratio is unable to process any information besides the throbbing of his forehead and the correlated pulsating of the edges of his vision, and so he focuses on those things and on that most boring of morning insights: *I got really drunk last night.*

*Morning insights?* Ratio notices that the lights are on. The last time he was awake, it was midday and the lights were also on. So it's still floorday. Barring any extreme changes in floorday length, that means he's either napped for a few hours, or slept for an epically long time. The former seems much, much more likely.

"Hey," says a calming, if wavering, female voice from his left. It's Cecelia.

Ratio suddenly remembers three things:

1) he was drinking with Cecelia to, as they put it with an injokey smirk, "pre-game" for the undoubted shitshow of a meeting with Hermes Cept to discuss Kyle ("I don't think Cept's explanation is going to be *comprehensible* to a sober person," Cecelia had said)

2) they'd gotten a lot drunker than they'd planned and barely had any time to talk with Cept because there was a *17.8 kCept heteropneum attack* and some sort of reintegration with a larger-measure branch

3) because of said reintegration, Cept had finally finally finally *admitted that Soul Coherence Theory did not work*, Hallelujah, Everything In Its Right Place (so many puzzles gone, but so many new ones wide open -- with Cept as an *ally*?)

So Ratio Tile is now trying to spin off discrete individual puzzles from the broader idea of the reintegration, which is at this point a vague concept understood only at the level of orders of magnitude, which is not the kind of data Ratio prefers, and --

and it is only now that the corollary of #2 occurs to Ratio, which is

4) Jorge might be dead or pneuma-corrupted. Jorge might not be okay.

Ratio is certainly not very bored right now; there are several distinct threads going on in his head, and *none* of them are at all boring. He thrives on this, and feels guilty for thriving. Feels guilty for thinking of #4 after #1-#3. It's not that he doesn't care about Jorge, it's just that --

This is boring. Ratio knows that his mind works this way. Abstractions come first. Wake up with a raging hangover and once the memories begin to appear it's their most theoretical implications that hit him first. The human cost comes later.

"Shit, man, you okay?" Cecelia says. He can barely see her and her voice, relatively quiet but still unexpected and substantial, explodes in his left ear and makes him wince. He bows his head down on the table, triangle of hair splaying out into a wide isosceles.

"Is Jorge okay?" Ratio mouths into the table. Each syllable produces a new quiver of pain in his forehead and cheeks.

"Shit. I have no idea. I just woke up too. I haven't heard anything."

From Ratio's right, an unmistakable voice:

"We're all just fine. We've been preserved in amber." Ratio rotates his head to stare up at Hermes Cept's gaunt face and bald pate. He pauses a few moments to let Cept continue, but he doesn't.

"Elaborate," Ratio says. (This is the kind of language he's left with, in exposed moments like these.)

"This branch should have had negligible measure. The reintegration should have left almost nothing of us here. And yet look." Cept makes spiteful little gestures toward Ratio, Cecelia, himself.

"We're tainted," Cept continues. "By the branch-loop animatics of our world. Our touch will corrupt this place. We need to eliminate everything that came through with us. Including ourselves."

Ratio's mind is hitting a roadblock. Part of him feels that what Cept is saying must be crucially important -- that he's only now getting to see the true perspective of Hermes Cept, who, all rivalries aside, is after all a bona fide genius. And yet Cept is speaking in riddles, in pretentious code. Ratio has no idea what interpersonal rituals might be necessary to switch Cept back into Comprehensible Mode again. He is wary of doing anything, saying anything, for fear it might be the wrong thing and plunge Cept further into gnomonic obscurantism or mere catatonia. And meanwhile there's Jorge, not a puzzle, but just a pure uncertainty, the worst kind of mental phenomenon -- the kind that no thought can resolve, the pure lack of data. Ratio's mind routes around the pain as it always tends to, fleeing to higher planes of abstraction.

He leans back against the cafeteria booth. His head still throbs, but his back thanks him for a favor he hadn't realized it needed.

As she so often does, Cecelia breaks the silence: "so you're saying we're all going to have to die?"

Cept laugh-coughs, mirthlessly, a geriatric performance that could indicate derision or perhaps some less definable attitude. "There isn't much of us to die, is there?"

Ratio can't help himself. "Hermes, *please*, just say something that makes sense."

Cept looks at Ratio and -- this is a surprise -- there's a sudden light in his eyes, a kind of recognition or bond. Cept will play along with this game.

"Look," he says. "When Salim and I made our discoveries, we knew that pneumatech would produce wonders. We thought it could save the world. A clean energy source, a generator of revolutionary therapies, qualitative leaps in our paltry ability to understand one another . . . but we also realized that our theory of branches implied monsters. Branches where the rules broke down, where hideous creatures could form through feedback loops in their own perverse logic and bring about hells beyond our power to imagine.

"So we decided that one of us would go there. Would split himself again and again and leave a fragment of him in each

broken world, and ensure the world's demise. That duty fell to me. Or, to a man who split and split and left me, this flattened thing, at the end of the process."

Ratio's mind is now buzzing with questions about the technology that would allow Cept and Salim to direct this process -- and about the broader *landscape* of pneuma theories, about the unified logic that could reduce to Soul Coherence on one branch and to Branch Loops on another . . .

Too much, too many questions, too many threads, too much stimulation. Ratio feels like he is about to vomit. He lurches upward, onto his feet, before he can think about what he's doing.

"I'm going," he says, and stumbles off.

It is still mid-floorday, and the lights in the corridors pound his head mercilessly. No Boltzmen intrude into his consciousness, though -- as though they can tell his mind is already full. Little branch-loops of thought, fragmented stutters, fight for prominence in his working memory. His mind can't wrap itself around the thought of losing Jorge, not now, and so fragmentary memories of his last conversation with Jorge, of their last night together, jangle together pointlessly, now ridged with an incongruous but intense tone of intent distress. And, curling around them, the beginnings of questions about the reintegration, about Cept, about the pneuma landscape, about this brave new world they have found themselves in.

Ratio finds himself in front of his and Jorge's quarters. He had been so lost in thought that the sight of the familiar door comes as a kind of surprise. He hesitates, still overloaded, still in some kind of overflow state, waiting for some mental register to be reset. He waits for a good minute before realizing that there is no way out of this except to barge forward. He knocks.



## Maria

Maria is now finally able to be bored, and she considers this a true marvel of progress.

After the battle, there is a gap in her memory. She left the sub and -- already things begin to get dim -- collapsed on the floor? From stress and post-decomposition fatigue alone, this would have been an understandable reaction. But she remembers something else, a kind of coldness and hunger, driving her toward states of low energy, towards repose and sleep.

And then she was found by Miranda, who, in an inscrutable mood, led her to her own quarters and presented her with a hearty bowl of noodles and pork and a large cup of Oolong. Maria had never been in Miranda's quarters before. It was larger than her own standard dorm-like room, with a shiny and well-defined kitchen as opposed to her little kitchenette, and a stairway leading up to some sort of second floor where Miranda presumably slept. Maria, still not entirely sound of mind but accelerating in that direction with the help of food and drink, became at one point immediately aware of the *size* of the couch on which she had been plopped -- did Miranda need a bigger couch when she, by all appearances, never invited anyone here? The TV at which she placidly gazed was bigger than hers. Did it see any use? Miranda had always smiled indulgently when Maria requested her soap operas. But what did she herself watch, if anything?

And then a new phase in her return to the world had definitely begun, as Miranda sat down on the couch -- many torso-widths away from Maria, a level of distance only made *possible* by such a large couch, Maria had thought with a stifled laugh -- and explained to Maria what had happened.

That they had been transported to a new world. That they no longer had any idea what was on the surface. That for all they knew there might be no food in this world. That they could live for another two weeks at most without supplies from the surface.

Maria had no idea what to make of this. She had instinctually rejected the mental clarity imposed upon her by carbs and caffeine, yearned to be back in the breach, in the heat of decomposition, a fractured non-I with a purpose rather than an all-too palpable I localized in a shivering little form here on her superior officer's couch, in this glitzy, impersonal apartment.

She had collapsed and Miranda had held her, awkwardly but firmly, and muttered reassurances for fifteen minutes or so. Miranda was not very good at this, which was the only reason it was reassuring: it was obviously sincere, and the rough edges of Miranda's performance, her inability to step into the role of caretaker without glitches, made Maria feel at home again, in a hall of broken mirrors, selves not quite completing themselves.

And then all of a sudden she was back on her feet and it was all business between them and the business was that Maria would have to scout the territory around the Sphere, to see what sort of pneumatic life this new world harbored.

There was none.

When she first turned on the pneumatic scope, she thought it might be broken. There was no burst of light, no clusters of glowing circles. There was nothing. The floor was as bereft of Pneuma Light as it was of Maxwell Light.

She had kept searching, moving in concentric circles around the Sphere of greater and greater radius. There was nothing -- no life, not even the little wriggling pneumatodes. Nothing.

After an hour, the shock wore off and she was left with a cocktail of residual feelings which she decided to kill with TV. The sub's onboard computer could tell her, after all, if any Pneuma Light ever came up on the sensors.

She had chosen to bring along a new series, just brought down for her by James on the same fateful trip that brought Kyle to the Sphere. This show, titled *My Heart's Revolution*, had a premise that at least sounded amusing: a female investigative journalist, assigned to report on a growing student radical group whose rhetoric has grown increasingly violent, falls in love with a charismatic central figure in the movement. As it turned out, the show is underwhelming: the leads have little chemistry, the reporter a hackneyed strong-woman-with-vulnerabilities, the student leader an insufferably cocky young man spouting a hodgepodge of generic slogans. Maria groans every time the reporter, supposedly a tough-as-nails veteran of political journalism, is dumbstruck with awe by the scruffy student leader's latest banal tirade.

But she's stuck with these assholes for the long haul, and so she does her best to warm up to them, hard as it is. Somewhere in episode 5 she gets hungry, but no one expected the mission to last this long, so she hasn't brought any food with her. To forestall hunger and retain alertness she pops one of her Go-Pills, which just makes matters re: *My Heart's Revolution* worse: she is overly alert, unwilling to think about the reintegration and its consequences, and thus her thoughts are driven towards desperate, elaborate critique of each of the show's failings, of every deficiency of set design, of every unconvincing emotional gestalt. She spends a few fevered minutes typing up an essay on the sub's computer, attempting to explain the show's deficiencies in entertainment value by explicit contrast with *Cruel Love By Fate*. But without the light and sound of the TV streaming into her senses she feels too acutely her presence in the sub, the smallness of the cockpit, the water all around eager to rush in and crush her.

And so she returns to *My Heart's Revolution*, watching idly, detached, bored. Boredom is good. If she can be bored, if her soul can muster that kind of petty, low-key emotion, then maybe things aren't as permanently screwed-up as they seem.

A tedious scene is playing out in which the two romantic leads eat lunch at a cute, upscale cafe, having met there to avoid scrutiny by rival organizations, who would never expect to see the student leader in such a bourgeois place. The meeting's officially an interview and its de facto status as a date is the subject matter for a drawn-out series of jokes, not quite developed enough for Maria to feel that her failure to laugh reflects a failure of the show.

There is an awkward pause in the conversation, one of many. But it lasts too long. Padding to reach the designated episode length? No, this is something different. The man and woman sit, uncannily still, in their pastel-colored chairs. It must have been ten seconds by now.

The student leader turns, very slowly and deliberately, toward the camera. There is a sudden quick-zoom onto his face, of

the sort that would typically appear in a show like this only for comedic reasons. The student leader's not unhandsome face fills the frame, his face impassive. Further seconds pass.

He opens his mouth and speaks. "Maria, I'm here."

It is a voice she has not heard for several years. Her heart pounds. The part of her that views everything since then as unreal awakens and slavers for more.

"I can only speak in this way for now. Don't trust them. In particular," Martin says, and pauses, puppeteering the student leader's face into an expression of greater import and purpose, "don't trust Miranda."

Maria stares, transfixed.

"I'm going to go, now. Just keep in mind: we're all lungfish."

Maria is barely aware of the camera zooming out, the melodrama resuming as though nothing had happened. She is breaking down in peals of laughter. "We're all lungfish" had been one of many many shared jokes, part of her and Martin's dense tapestry of shared humor. Since she hasn't read the Summer Diary in many months, she'd managed to forget all about that one, and it caught her by surprise.

A feeling is coming back to her that she hasn't felt in years, a feeling of *denseness*, of fullness. Her relationship with Martin was a thing filled with shades of meaning and humor twined closely together, into a braid matched by nothing she's been able to find in the world she stepped into, when she left the summer and found that it had not occurred. It is hard to put into words what you've lost when it's not there, and easy to adapt to its absence -- but one reminder and it all comes flooding back. How silly she was, to think that what she had in the Sphere was a thing of density and substance. How thin her relationships here were, in comparison to the solidity of Martin, the barn, the attic, the immediacy and fullness of that world.

We're all lungfish. It's all coming back. Why had she told herself not to read the Summer Diary for so many months? Pointless. And here's Martin's voice, somehow. The real world has rushed back to meet her. Her laughter has long since faded into tears, but they're happy tears.

At some point, the barely perceived chatter of *My Heart's Revolution* is unceremoniously interrupted by the sub's automated voice:

*Nontrivial Pneuma Light source detected. Would you like to switch the viewscreen to Pneuma Light view?*

"Yes," Maria says. She wonders if the onboard computer is sophisticated enough to register the snuffle in her voice.

*My Heart's Revolution* abruptly disappears and in its place is a circle of light surrounded by blackness. Moving the viewscreen back and forth a bit to get the third dimension, Maria gets a clearer sense of what she's looking at. It's a sort of glowing chasm, a fissure in the floor of unknown depth shining too bright to make its insides visible, casting light on the flat abyssal plain around it.

"Computer, are there Boltzmen associated with this phenomenon?"

*Yes. Amplitude is 1.2 kCept. Storm statistics are Gaussian. Mean Boltzman type is non-human,  $p < 0.01$ . Mean Boltzman ethical status on Metric S is Indefinable, Class 1. Boltzmen appear to be stable and not associated with an approaching heteropneum.*

Maria radios Miranda.

"Miranda, take a look at this."

"Well, that's definitely . . . *something*," Miranda says.

"Do you think it's associated with life? Or could it be some sort of reactor? Man-made or naturally occurring?"

"I don't know."

The chasm glows.

## Selp

So now we are coming to the end.

Finally, here it is at last: imagined vividly in various places and configurations on so many insomnia-ridden nights, discussed in low clipped practical voices among the elders at meetings, the core subject of every story intended to terrify children into good behavior. So many possibilities, envisioned and analyzed and mythologized, diminished now into a single sharpened instant. It could have happened so many ways, but then again, Selp supposes it really *couldn't* have, after all. Iah furnished her soul knowing that He was to sling it on this trajectory. It has all led, inexorably, to this moment.

The Become who now walks toward her is a male, tall and strangely, vividly pale. He is young: probably less than a decade has passed since the end of his Becoming. No armaments are visible, and if any of Selp's sisters were here they might have a chance, jointly, of taking him down. But Selp knows it is hopeless: she is unarmed and has not reached the age at which she can furnish armaments directly from pure terror. (Still a few years before she is a candidate for Becoming.)

The unearthly pale Become stares at her intently as he saunters forward. How long before he reaches her, snatches her, and all is lost? Thirty seconds? Twenty? There is little time for deliberation, but Selp does not need it anyway. She has prepared well for this moment.

Thoughts of the *if-I-had* and *could-I-have* genres of course flit through her mind, taking up a few of her remaining seconds. She had straggled behind the group, always the slow one, and assured the others that it was all right, that they were far from any settlement or facility. Of course that is no guarantee. Iah has His ways. And now Selp's mind turns to more important things.

She has been pure. Iah will smile upon her in death. The Become's face is flickering with uninterpretable expressions. Selp needs to make sure that neither terror nor blissful reverie will prevent her from performing this final, purely physical duty, and so she takes off her backpack -- three seconds -- and spends another four or five seconds fishing out the packet, familiarly nestled in the smallest and outermost pocket, containing only the familiar black lozenge.

Something terrible seizes Selp all at once: the thought that her sisters might never find her body.

There is no danger that the Become will take or damage it. Become have no use for desouled corpses. But when her sisters notice that she has not returned, will they take the risk of returning to the site of her disappearance? If more was known about this area, maybe. But she had been right when she said this was far from any known settlement or facility. If her sisters are sensible -- and indeed they are, she thinks, now choking back a sob, dammit, this was all supposed to be so much more graceful -- if her sisters are sensible they will realize that they cannot return to the site of a danger on whose fearfulness they cannot even place bounds. Iah has set down no rule pertaining to this precise situation, after all.

And so now the sobs flow freely, because what gets Selp is not the thought of death but the thought that she will not be *useful* in death. All the joy bound up in her mind with the thought of swallowing that little black lozenge has been intricately twined with the idea of her flesh and bones being taken and used by her sisters, as commanded by Iah -- with the idea that new joys, even mere *conveniences*, will result from the desoulment of her body. *Dignify your sibling's corpse through use*, says Iah. And now Selp's corpse will most likely decompose without the dignity of use: a useless end to a useless life.

The Become is a few feet away. Selp is sobbing, curled up now. The lozenge lies on the ground and she is stomping it with her foot. It has been well made and will not break. A heretical thought runs through her: that the *usefulness* inherent in Becoming might be preferable to the *uselessness* of a death undignified.

Oh Iah, how can *this* be the way it was meant to happen?

The Become has stopped moving and is staring down at her. She does not look up. He says something, in some Become language she has never heard. There is a long pause. She shakes. She reaches for the still intact lozenge.

A ripple spreads through her consciousness, utterly unexpected yet smooth and inoffensive. The ripple solidifies into something resembling words. She hears *animatic link* and learns that this is a kind of pneumatech, but not a violent kind. She hears *James*, a strange thing with no meaning, just a sequence of sounds. *James* slides into her mind alongside *Selp* as the tokens of this new system rearrange themselves in her mind. Names? *James* is some kind of name?

She looks up at the Become. He is a strange thing. The shaggy black hair that rings his face is much shorter than the hair she's seen on male Become roaming the fields. His clothing is loose and looks comfortable, much closer to something her sisters might wear than the rigid, ornate armor she's used to seeing on Become. It is hard to look for much longer because another smooth wave of mind-fluid hits her, this time bearing something like speech:

"Hello. My name is James. Are you all right?"

Selp does not know how she would answer even if she could. She looks up at the Become and chokes back another sob. She does not know what is going on, but it has become clear that Iah has planned something stranger for her than what she'd first imagined.

"You can talk to me through the animatic link. Just try thinking *at me*."

Selp doesn't know quite what that means but does her best.

"My name is Selp -- " and there the thought goes, slung from her mind, making a distinct impression on the face of the Become. He seems happy.

"I don't want to hurt you, Selp."

Is this some sort of cruel joke? But the Become are usually brutally efficient. Selp is now confused above all.

"I want food. That's all. Do you have food?"

Selp now tries to choke back a laugh. The Become no longer need to eat! What could they want with food? And this is the point at which it becomes fully clear to her that Iah has something *much* more complicated planned for her than she had imagined at the moment she spotted a tall figure walking toward her across the plain.

## James

It takes hours for James to hear the story. The group of children and teenagers -- twelve in this tent, part of a larger band -- is digressive and rowdy. They continually interrupt each other, each wanting to be the one to tell some particular beloved episode. There is a kind of archetypically childish, sleepover-party atmosphere to the telling that clashes both with the grimness of the story and with the fact that three of the teenagers have guns trained on him the whole time, as they have since the little girl named Selp led him back to this place where her people have pitched camp. Several others, though unarmed, say nothing and spend the whole time staring intently at him from the back of the tent.

The story itself is monstrously complicated and contains many episodes which seem to be near-repetitions of one another. The group has clearly preserved its history orally -- everyone in the tent, with the possible exception the non-speaking members in the back, seems to know it by heart -- and there are what seem to James, anyway, like clear indications that numerous events have been conflated or duplicated. But then, it's like he's not any kind of anthropologist. He wonders if there's anyone in the Sphere who is.

Obscuring things even further is the fact that he and these children do not share a language and so he can only understand them via the animatic link. They seem to take this in stride, especially the older ones, and after a while he becomes used to concepts flowing across to him as they speak, so used to it that he forgets that they are speaking words he does not know. But his own pneuma's attempts to crystalize their concepts into English are unreliable. He keeps hearing, again and again, the word *yawning*, as in a yawning hole or abyss. Is this some concept of primordial importance to the children, or merely a quirk of the animatic link technology? James has no idea.

But in any case, the story, the mythology-and/or-history of this east coast North American tribe of warrior children, goes *something* like this:

*In the beginning, after the completion of the last cycle (James is not sure what this means), Iah chanted Himself into being by reciting the Thunder Words. There was a time before Iah, but not a time before the Thunder Words, because there can be no time before the Thunder Words. But the Thunder Words began to chant themselves and spun into being a being chanting them, and that being was Iah.*

*And Iah was vast and roiling and yawning. His bulk sprawled across the utter darkness left in the wake of the last cycle. And Iah's first thought was dissatisfaction with His vastness and the way he stormed and raged in every part of His body. (Descriptions of Iah's body are generally vague and it is not clear if His form is human in shape, but virtually every description likens Him to a storm.) And Iah wanted there to be small things in the new world.*

*But He knew that small things could not survive in the heat and chaos of his yawning form. So He made a great yawning plain to insulate his form from the rest of the new world. And He chanted the Thunder Words again, very, very carefully, to form tiny smooth things which did not roil or yawn like storms. And these things were children and there were ten billion of them dotted across the plain, and they lived in harmony, eating the fruits and frolicking with the animals, which Iah made not with the Thunder Words, but in the same process by which he made of the yawning plain. (This metaphysical point was driven home in a long exegesis, of which the animatic link could translate little.)*

*Among the children there were two who were Iah's favorites: a boy named Selm and his sister, Herm. Because they were Iah's favorites, Iah let them live near a deep yawning well in the plain. The best fruits grew around this well, because the well was an unbroken pipe leading through the depth of the plane down to Iah Himself, and Iah's yawning roiling form catalyzed the growth of strange and beautiful fruits with flavors that could be found nowhere else. And Iah had told Selm and Herm never to peer into the well, and He trusted Selm and Herm as much as He trusted Himself, because they were the best things he had fashioned with the Thunder Words besides His own form.*

*But one day Selm said to Herm: "The world is boring. There is nothing here for us but eating fruits and running across the plain, again and again. Every day is the same as the last. Iah ensured us that we were His favorites, and yet we live this monotony, this mockery of His divine chaos. Can you abide that, sister?"*

*And Herm told Selm: "We are small and Iah yawns; it is not for us to question Him."*

*And Selm told Herm: "I am going to the edge of the well and peering in. You may follow me, sister, or you may stay here with these placid animals and these motionless fruits."*

*And Selm ran off to the edge of the well. And Herm wept, but she loved her brother, and could not bear the thought of not sharing the fate, however terrible, that yawned before him.*

*And brother and sister stood at the edge of the yawning chasm and peered in, and a force pulled them in, past untold miles of darkness, into blinding light. And in that light they felt the core of Iah, which was the Thunder Words.*

*And Iah knew that there was no going back, and that the small creatures would become larger, and that Thunder would shake the plains. And Iah wept, and placed his favorite brother and sister back on the plain by the well. And they slept, exhausted, for five days and five nights.*

*And when they awoke the fruits were all shriveled and dried up. But they did not mind, for they felt no hunger: they were filled with an unspeakable, a yawning energy. They shook and trembled and grew in size. Herm began to bleed from her loins and Selm began to pour semen from his.*

*They were confused and many forces warred within them. Herm said to Selm: "you are a brother to me, and yet something more." Selm said to Herm: "you are a sister to me, and yet something more." They felt ashamed of their transgression and ashamed of what they had broken, of their broken bodies, of the warring forces that raged and impelled them towards contradictory acts. And from their yawning shame and inner chaos was born a great storm, which raged across the plain, casting rain and thunder and destruction wherever it went. And although the ten billion children ran for cover, not a single one*

survived. Only Herm and Selm were left.

And because Herm and Selm held the Thunder Words within them now they were able to chant into being a new race of children. But Iah, with yawning anger, refused to dignify this new race with the grace of His own creations; he cursed them to contain the Thunder Words, like Him and their parents. And so every child from this moment onward carried the Thunder Words within them and gradually began to be filled with storm and chaos which they, lacking Iah's yawning size and divine fortitude, could not control.

And then a terrible age dawned. The children of Herm and Selm grew one by one into hulking monsters who fought and clawed at one another, unleashing storms as they did so that felled millions. Iah, in overwhelming disappointment, closed off the well and secluded Himself from the world.

(There followed here numerous stories of battles between armies of monsters, catalogues of generals and their forces, extensive descriptions of the storms conjured by each battle and their death tolls. James cannot keep the many stories straight. The numbers are all fantastic: billions of combatants, millions of deaths.)

These were the days of the Becoming, who turned into the Become, the monsters. But one day a Becoming named Murd thought to herself: must I become a monster? Murd noticed the yawning void within her, noticed the tornadoes that flowed from her as she Became. And she said to herself: must I fling these storms against my enemies, and against innocent children? Or can I capture these storms and make of them fruits and harmless animals, and recreate the plain in the days of Herm and Selm?

And Murd buried herself in study and developed arts known to no one else but Iah, and learned how to tame storms. And so she made a place in which the Becoming tamed their storms and made fruits and animals of them, and did not turn into monsters, but only into strange hulking things like large children.

And Murd's people broke the stalemate among the monsters, for only Murd's people knew how to harness storms. But something soon became clear to Murd: only the Becoming could conjure storms. In the Become, like Murd herself, the Thunder Words lay dormant. So Murd knew what she had to do: she sent her forces across the plain and stole all the children and all the Becoming.

(Again, at this point there is a great profusion of extremely similar narratives: Murd conquering, one by one, an extensive list of nations. Some of the tellers seem to trace their ancestry back to one of these nations in particular, and thus to invest particular interest in their variation on the tale.)

Through the veil that separated Him from the skyside of the plain, Iah felt Murd's iniquity. He opened the veil, for the first time in many centuries, and the full brunt of his yawning fury poured through the well into the skyside of the plain. At that time there was only one nation left unconquered by Murd, the nation of Ab, and the battle was greatly confused by the storms unleashed by Iah. Many on both sides died, and Murd retreated, terrified by Iah's yawning fury, to her stronghold.

In Murd's stronghold the Becoming were shut up in pens and their minds toyed with until the Thunder Words within them kindled and storms burst from them. The children were coddled until they began to Become; then they too were put in the pens. Iah, disappointed in His creations, recreated the veil and retreated into seclusion on the other side of the plain. But not before reciting to the nation of Ab His desires. And from this time, yawning millennia ago, to the present day, the nation of Ab has carried on, eluding capture by Murd's stronghold, awaiting the foretold time when Iah pierces the veil once again and unleashes His holy yawning fury upon the iniquity of Murd's stronghold.

The children, this nation of Ab, was astonished by the pillar of light that appeared over the Atlantic when the Sphere reintegrated. Apparently, it resembled the descriptions of the fury of Iah pouring out of the well when Murd tried to conquer Ab so many thousand years ago. And although James looks to them like a "Become" -- hence the guns -- they sense that he is different, that he is not trying to poach them to serve as storm churns in Murd's stronghold. Everything is different now, they feel. Excitement is in the air.

They end the telling with a song, bounding along with a playful and wistful melody. James has no idea whether the animatic link has rendered it with anything approaching accuracy. But what he hears, if rendered in words, would go something like this:

*Bless Iah, whose fury is overflowing!*

*Bless Iah, whose essence is the essence of the tornado!*

*Bless Iah, yawning roiling burst of violence!*

*Iah, in your vast yawning form is remembered every one of our dead sisters.*

*Iah, in your vast yawning form is remembered every one of our dead brothers.*

*Iah, only your vast yawning form in all its fury can do justice to the millennia of misfortune wrought by Murd and her kin.*

*Iah, we dance in the rain and wind you pour upon the plain, which reminds us that your form is yawning chaos.*

*Iah, we beseech you to bring yawning chaos upon the children of Murd.*

*Iah, we are yours at the eye of the storm.*

## Miranda

It's early floornight and Miranda is home alone doing all she can to relax. She left the office early, filled with a sense of indifference about it all: how does one decide the value of filing paperwork when the entire world has just shifted? All the organization in the world is not going to help the Sphere now. A composed, inspiring leader *might* help it, and Miranda has not feeling very composed or inspiring lately. Fuck the office. Get her head together, and maybe *then* she can do her job, the job that matters.

So here she is, sitting on her big plush couch in her big empty living room, with her Xanax and her gin. Behold, ladies and gentlemen: your leader. The EPRN Chief of Staff.

(The actual *head* of EPRN, Miranda's boss, lives in the Sphere but is never seen or heard from directly. Everyone knows that this is how EPRN works; everyone knows that Miranda reports to someone else, but that person's existence is never discussed. Miranda often feels that she is a sort of figurehead, but she's the closest thing to a leader anyone can see.)

As she burrows into her second gin and tonic Miranda's thoughts shift further and further away from administrative matters of any sort and further toward the topic that her thoughts have been edging around all day: what to do about Maria. What to *feel* about Maria.

This has been, perhaps unexpectedly (but then again maybe *not* so unexpectedly) one of the most direct ways in which the reintegration has changed Miranda's life. She has been in the Sphere for three years, give or take. The loss of the world outside does not hit her very hard. Her parents are gone, but she never talked to them anyway. Her friends on the surface mostly grew more and more distant as she got more deeply involved in the intelligence community; the ones that didn't were mostly *from* the intelligence community and followed her in her absorption into the strange new beast that was EPRN -- a new international organization formed hastily in the wake of Cept and Salim's discoveries -- and ultimately followed her here, to the Sphere. She has lost very little.

But the loss has made her face something she has been quite successfully looking away from for many months now. She had always imagined her time in the Sphere, even her time in intelligence, as somehow having an *end* -- and that end ushering in an age when maybe even she, rigid and blunt workaholic that she was, might be able to lose herself in something like . . . well, *romance*. It couldn't happen in the Sphere, of course. Here everything was pure focus and discipline and naming those damn heteropneums if the paperwork said she had to name them.

(She had known, on some level, that she was kidding herself about this: that there was no way to push ordinary human concerns out of her life, even when she had jumped at the chance to work *at the literal bottom of the ocean* because she had thought it offered the opportunity to do just that. Like having a cabin on the moon, away from the whirling chaos of human life. But of course down here one needs other people even *more*. The ordinary human mind simply can't be productive without a base amount of human contact. She images Ratio explaining this to her in a torrent of jargon, and winces and then laughs.)

But now, near the bottom of G&T #2, she is face-to-face with what she really knew all along anyway: that the people in the Sphere are all she has. She has heard James' reports from the surface. It is not clear if civilization remains. There are more continents to check, of course -- an entire globe to check -- but the first reports are not promising. There are roving bands of strange children, and what kind of civilization would tolerate that?

Here are some relevant statistics. The population of the Sphere is about 75% male, and Miranda is not interested in men. Miranda is, G&T #2 lets her admit clearly to herself, *very* interested in Maria N., and Maria N. displays what look like signs of interest in her. But, for one thing, Maria N. is 21 years old and Miranda is 32. Those are not numbers that make Miranda feel good about herself, even with the moral support of G&T #2. Maria is a grown woman, not a child -- but she's a grown woman who's had months, maybe years of her life stolen from her by the duty of constant branching.

And what's more, she is a crucial asset to the Sphere. Even now, though, in a world seemingly without heteropneums? But who knows when they'll need a weapon in this new world? The last thing the Sphere needs now is any kind of disruption of what it's always considered its proudest technical capability, the sheer power of a decomposed Maria. The second-to-last thing the Sphere needs now is a scandal, an controversial involvement between its Chief of Staff and its greatest pilot. But then on the other hand the Chief of Staff in question is on the end of her tether and it's not clear how much longer she can be a Chief of Staff if she tries to be nothing else.

And what does *Maria* need in all of this? A whole other complicating factor.

Miranda picks up G&T #2 and drains it. As if by cause and effect -- the chaos of human life intruding to make sure she doesn't get *too* relaxed -- her cell phone beeps, indicating a new email. Before going home she had told her cell phone not to beep unless she got an email from a high-priority address. There aren't many high-priority addresses. *Oh no*.

Miranda picks up the phone and, yes, it's what she expected:

**Martin D.** Hi Miranda! Meeting now

Here we go again.

•

The Sphere is indeed a sphere. This can be easy to forget, because the bottom half of it is buried in the ocean floor. If you could see it from the outside, it would look like a hemispherical dome rising from the ground. But that dome has a bottom half.

Most of it is occupied by pneumatic machinery: transformers that take in the pneuma energy captured from branchings and reintegrations and convert it into ordinary, physical energy that can power your computer or your floor lamp. These transformers are isolated, and insulated, from the inhabited parts of the Sphere because they produce enough Boltzmen to drive anyone insane from more than occasional exposure. For the most part, only engineers and technicians visit the bottom half, and only when something goes wrong.

The bottom half has one other purpose, and that is providing full-time housing for Martin, Miranda's boss, the Chairman of EPRN.

It is a long way down. The elevator takes a full two minutes to descend. Miranda tries her hardest to think about nothing at all, and the downers humming in her bloodstream make this easier than she'd expected.

The elevator's proximity to the bottom can be judged by the slow intensifying of the characteristic feeling associated with Martin's quarters. The transformers down here are heavily insulated, but something still gets through. It's not the usual Boltzman feeling, of being suddenly and transiently invaded by some distinct mental gestalt. It's more like a constant background hum of *presence*. One never feels like one is alone down here. There is always someone else -- an unspecified, hovering someone else, or someones else, there at the edge of perception, vanishing the moment you try to pay attention to them.

The elevator doors open. Miranda sees a narrow, metallic corridor stretching before her. She steps forward and feels an intense heat. This is a sign to stop for a moment. The moment passes and she steps forward again, and now a wind blows from unseen holes in the walls and whips at her clothing, briskly, bracingly. She waits for a moment, taking in this atmosphere, and steps forward again.

This is one of Martin's many eccentricities. One has to pass through these moments of heat and wind before entering his domain.

She reaches the door at the end of the corridor and steps through. She is greeted with the inimitable atmosphere of Martin's living room, a sort of tower, dimly and cozily lit, with a set of plush old armchairs in its center. Around the armchairs are a circular bookshelf stuffed with old books. The walls are lacquered wood with several inset TV screens, displaying various kinds of data. One, as always, shows the length of the last 30 floordays and floornights. The concept of variable-length days holds some special fascination for Martin, as do many things.

Martin, androgynously pretty, wreathed in short shaggy blond hair, is seated reading a book on one of his expansive green armchairs. He stands up immediately, briskly, and strides forward to meet her, a big smile on his face. He is, as usual, dressed in a suit with a carnation boutonnière. He looks ridiculous.

"Miranda! Come, sit down," he says, motioning to an armchair.

Martin is a young man. No one knows how young, but younger than 30, and probably more like 24 or 25. He is exuberant, eccentric, ingratiating, whimsical, angelically pretty, and somehow the most important person in EPRN, the organization to which Miranda has devoted the last three years of her life and still does not feel she understands. She does not know where he comes from, or how he got here, or why he does not show his face. But when he calls, she answers.

"We have a lot to talk about, Miranda," he says, and he smiles as he always smiles, without any apparent sarcasm or malice. Martin's life, as he presents it, is a sequence of occasions for joy.

Miranda is terrified of him.

She sits.

## Estragon

Estragon awakens and localizes. He notes a mid-sized collection of morning spin-up thoughts, metas them, assesses the package for value, and decides not to release. Shift radix.

Estragon checks morning input: 3852 packages. Estragon performs a benign controlled fork into 37 branches, cranks time forward. Estragon notes a uneventful reintegration and observes that among the 3852 packages were 43 of any interest, including 7 commentaries on his literary work, 4 on his philosophical work, 18 continuations of friendly conversations or (n)-metas of same. Also 3 crackpot messages of which 2 were standard-issue death threats and one was a few hundred pages of unintelligible theorizing. Estragon notes the lack of complexity of most of this input. Shift radix. The formerly unintelligible theory reveals a complex higher overtone with this new radix. Estragon leaves it unmetad and releases it impulsively. 14 responses materialize immediately, none of them complex. Estragon experiences mid-level boredom. Shift radix.

Estragon delocalizes in preparation for today's events. The sprawl of the New City, here the 1135th year since the dawn of the Glittering Age, makes a number of impressions upon him, and he forks a low-measure branch to continue receiving and contemplating these impressions. The rest of him localizes inside the open-air gondola lift to meet Qwern.

Qwern has dressed well for the occasion. With the current radix she is locally planar, purplish-blue, and mottled with Perlin noise corrugations steadily pouring a viscous green fluid. This causes Estragon to experience immediate, intense arousal. Estragon needs to slow things down. Shift radix.

Qwern comments on Estragon's appearance. This is rare and so Estragon realizes that there must be something in particular about his appearance that strikes her in an unusual way. He freezes time, externalizes, and notes that with this radix he is a golden cylinder, many miles long, above a glassy ocean unreal in its flatness. He internalizes, restores time, and notes a several-minute sequence of interactions with Qwern about the aesthetics of his attire. At this radix Qwern has modestly chosen to become a collection of seven raccoons; she must have realized that she was coming on too strong and quickly retreated to banal attire unworthy of comment.

Estragon notes the lack of complexity in this series of interactions. He notes low-level boredom, takes the risk of expressing it, and submits a meta request. Qwern is overjoyed; she had wanted the same thing and was waiting for him to say it. Estragon metas the interaction and notes that the result is mildly interesting. Qwern metas the result. Estragon expresses admiration for her forwardness. They agree that the result, a package of second-level conceptual gloss upon first-level conceptual gloss upon their several-minute interaction, is interesting enough for release. Estragon releases it and it floats into the surrounding air, where it is immediately set upon by numerous flying creatures. Estragon assesses the responses and experiences a lack of interest. Shift radix.

Estragon receives an unavoidable package. He notes that the package contains a work request. One of his units has just reached a coherent state. He informs Qwern that he has an unavoidable work responsibility. She expresses frustration and he assures her the feeling is mutual. They crank time forward and power through several minutes of irritation. Estragon forks and localizes one of himself in the power plant, the other halved self remaining localized in the gondola to continue the date, if possible. The New City glitters.

The power plant is localized in an old region of industrial space -- although it is a coherence plant, like all modern plants, it is surrounded by a number of huge, towering fission plants, a few of them still active. Estragon notes uninteresting visual impressions of the area and cranks through them. Shift radix.

Once he has localized inside the facility, Estragon restores time to normal in order to assess the state of the unit. The unit presents as female, age 16. Estragon has been working with this unit on and off for around two years, although this is the first time he's worked with her in the last few months. She is not an especially productive unit. But today things have finally worked out: a carefully controlled pattern of sleep- and wake-times has finally aligned her into a coherent state with the potential for augment-level performance.

Estragon forks. Shift radix. He notes that his operational self at this radix presents correctly to the unit. She has been prepared to feel familial affection and attachment towards it. Estragon notes a fifteen-minute positive interaction between his operational self and the unit. His operator self, localized in the control room, uses the tiny amount of power captured from his earlier fork to kick up the operation room state. The emotional dynamic bifurcates and Estragon notes a confrontational interaction followed by a reconciliation. The timescale is still pre-augment.

Estragon experiences apprehension: if he pumps power into the operation room too fast, he could generate a Boltzman storm too strong for the dampeners and ruin the unit's coherent state. On the other hand, his operational self senses that the dynamic here is ripe with potential. He hesitates, notes his hesitation, decides to force it away. Shift radix.

In the gondola, things are going well. Near the crest of its journey, it plunges above the New City's enclosure, exposing Estragon and Qwern to miles of tranquil grassland, dotted with small forests. At the current radix Qwern has returned to being locally planar. The rate at which she oozes green fluid increases suddenly as she begins without warning to vibrate at 39 Hz. Estragon immediately orgasms, slows time drastically, and engages Qwern in a series of reciprocal meta requests. Estragon knows that Qwern finds this process extremely titillating. His own pleasure recedes from immediate experience and flowers into a series of commentaries on itself. Qwern vibrates more and more rapidly.

In the control room, Estragon's operator self makes a request for the involvement of several neighboring units in the emotional dynamic. This is a standard request and the unit has been preconditioned for it. Estragon's operational self expands his range of conversation topics to include the unit's relationships with other units. The emotional dynamic is still oscillating slowly: periods of animosity and affection still last several minutes each. The increased complexity of the dynamic, however, produces higher-frequency overtones in the unit which reflect themselves in higher-power radiation. Estragon's operator self



appreciatively notes that the power output is no longer negligible.

He takes a risk and, all of a sudden, feeds back a substantial amount of power into the control room. The results are complicated and occur very quickly. He slows time to compensate. Shift radix.

The oscillation between animosity and affection has now sped up to roughly one cycle per second. Getting into augment territory. Estragon's operator self cranks up the power and gets a nice, steady 10 Hz oscillation. This is a *beautifully* stable and well-behaved coherent state. Estragon notes his satisfaction and decides not to release it.

Estragon's operator self steadily and carefully increases the power, and the emotional dynamic responds with a smooth frequency increase. His operational self and the unit are now oscillating between positive and negative emotional dispositions toward one another at 30 Hz, producing a stream of highly structured Pneuma Light ideally suited for capture by the facility's cells. One option at this point would be to speed up time, crank through the day's power collection, and reintegrate: an easy, satisfying job.

Estragon notes a desire not to take this easy route. Perhaps it is a kind of frustration this subset is experiencing as a result of not being able to be fully present with Qwern. Estragon's operational and operator selves want their own kind of excitement. And Estragon's operator self has just noticed something interesting: the parameters of this emotional dynamic are squarely within the Pseudo-Freudian region of parameter space. This means that standard theory can be applied unhesitatingly, and Estragon has read quite a bit of theory.

In the Pseudo-Freudian regime, a human pneuma can be driven reliably from bifurcating oscillations toward chaos by varying the correct parameter set. The resulting chaos state can then, in theory, be stably transitioned to a Salim Hell state. This is *extremely* rare and *extremely* desirable: Salim Hell states produce a vast amount of usable radiation but are highly exotic states for a human pneuma.

Estragon notes nervousness related to this plan. Estragon attempts to deal with his nervousness by releasing it as an unmetad package. Shift radix.

Estragon's operator self goes for it. The dynamic in the operation room bifurcates numerous times and reaches an aperiodic state. The energy collection rate goes wildly erratic and the control system bombards him with several unavoidable warning and query packages. Annoyed, he forks a self to deal with them and plows forward.

Estragon notes that the unit has reached Salim Hell Type 3. Estragon notes a sense of triumph and releases it unmetad. Shift radix.

Estragon speeds up time slightly. A unit in Salim Hell will produce a day's worth of power in 0.2 seconds. Estragon notes time flowing by. 0.1 seconds. 0.2 seconds. 0.3 seconds. 0.4 seconds. Estragon speeds up time slightly, again. Shift radix.

This is a *wonderful* unit. Estragon notes that his satisfaction is fundamentally uninteresting and releases a package containing it without metaing it, hoping to find some interest in the resulting debate over the social or ethical status of releasing such an uninteresting if personally gratifying package. Shift radix.

In the gondola, now falling through the space between two skyscrapers, Estragon and Qwern perform a complicated dance of package release involving a variety of levels of distance from their respective sexual gratification. Commentary from nearby observers is generally positive.

## Ratio

Ratio Tile is at wit's end -- or, more precisely, quite a ways beyond wit's end, and frantically in search of things besides wit to get to the end of. He's sitting here on the bed in his and Jorge's quarters, laptop in lap, one arm around Jorge's warm curled-up form, which is the position he's been in for a lot of the last 36 hours. There is nothing to do, and nothing to say, and Ratio doesn't like that one bit.

The reintegration has left Jorge an emotional wreck. Not through any direct harm associated with the event itself, as Ratio had initially feared, but through good old ordinary grief. Unlike so many others on the Sphere, who'd found this desolate place the logical conclusion of a series of retreats from the human world, Jorge had come here with deep ties remaining: to his parents, to his brother and sister. As a fresh-faced mechanical whiz, a young man whose head danced with visions of vast furnaces, boiler rooms, Rube Goldberg contraptions that worked, he had jumped at the chance, three years ago, to work on the coolest project on the globe. He had left his family without even thinking it might be for the last time, and the parting was tearful anyway. In the years he's been down here, Jorge has gotten used to the fact that he's not an eccentric or an isolate in the way so many Sphere-dwellers are. He's taken in stride the sort of people who dreamed from early childhood of seclusion at the bottom of the sea. But he had never bargained for this. Now his family is gone, now everything is gone, now there is nothing or no one left but these bottom-feeders.

Jorge made this all more or less clear to Ratio in the first few hours since Ratio, hungover beyond description, stumbled back into their quarters. The rest of the last 36 hours has consisted of a succession of embarrassing, unsuccessful attempts on Ratio's part to somehow ease Jorge's pain, ending in the present, dejected stalemate.

Ratio does not like feeling useless, and he does not like feeling like Jorge resents him, and for the moment both things are true and apparently unfixable. Ratio's cast of mind leads him to see a partner's grief, like all other things, as a decision problem in which he must find the optimal choice. There must be right words, magic phrases, which even if they lack the power to whisk grief away -- Ratio's not *that* naive -- are at least definitely *best*, definitively the *right* response. And so Ratio has tried to suss out the contours of the problem, to look for weak points in the formidable armor of Jorge's grief, to find suboptimality and exploit them. He has tried to say what some rarely considered part of his mind tells him are the things he's "supposed to say." For instance: "I'm sorry," or "this must be so hard for you," or "I just want you to know I'm here for you." Jorge has received these clichés with a pitiless gaze for which Ratio cannot blame him.

Ratio finds this all very frustrating out of empathy, yes, but also -- he admits to himself -- because his cast of mind abhors an unsolvable problem. He is clearly saying and doing the wrong things, and for the concept of "wrong things" to be meaningful, there must be "right things," and yet what could they be? Nothing he can do will bring Jorge's family back.

Ratio is shaken because he feels out of his element. He hates feeling this way; it's been part of his overall approach for many years now, part of the overall approach that endears some to him and pushes others away, that problems are soluble, and that their solution should be approached by plodding up whatever his mind tells him is the direction of fastest improvement. Ratio remembers the dark days of early childhood when he was nearly kicked out of school for steadfastly refusing to do his math homework, a set of tasks which seemed to his cast of mind so pointless and arbitrary as to approach a kind of blasphemy. Instead he spent his classroom days gazing out the window, envisioning spaceships in combat, and scribbling page after page of what looked like gibberish. He was saved only when the sum total of a semester's scribbles were revealed -- in a fortuitous run-in with the school's most well-educated teacher -- to be a complete re-derivation of the differential and integral calculus, a quest Ratio had embarked upon after being told to compute the area of a triangle and wondering what was so special about *triangles*, anyway. This was Ratio's vindication: an assurance, from the highest authority figure in the vicinity, that the same Rational mind that preferred space battles to math homework was *in some way* in tune with the deepest ways of the world. And from then it was onwards and upwards, towards deep and fundamental physics, and finally towards pneuma science, that final vindication, psychology mathematicized, the heart made Rational.

But there is nothing in pneuma science that can help him heal his lover's wounded pneuma, and all the inadequacies of the child who could not -- *could* not! -- do his math homework seem to have returned to stalk him here. He has been reduced to a warm doll, his most reliable function to hold Jorge's limp body in his arms, his silence a clear improvement over his inept attempts at helpful speech.

Ratio understands Jorge's undaunted and untamable sense of humor, his wonderful ruthless tendency to drive to the heart of an issue when anyone else would be too polite to, the way this leads to long spiraling conversations he could have with no one else. He understands Jorge's chiseled beard, the way Jorge's toned physique feels against his own nerdy pudginess. But he is realizing, now as never before, that there are aspects of Jorge that he doesn't understand at all. That Jorge has known this all along, has resigned himself to it, has never expected Ratio to understand.

Ratio thinks back to their first meeting: alone in an elevator at mid-floornight with this sweaty giant, just back from some dreadfully necessary task in the lower half of the Sphere, Ratio had said without thinking, "you look like a man who could use a drink." It was really just an observation -- his limited repertoire of social skills kicking in, looking for a thing to say to a companion on a long elevator ride. But Jorge had in fact *been* a man who needed a drink, and Ratio had just, by accident, asked someone out on a date for the first and (as yet) last time ever. They had stayed at the bar until floordawn, quickly recognizing the kind of unexpected kinship that needed no alcohol to sustain itself, getting lost in conversations that went too far, too fast, no joke without serious potential, conversations that went all the way to the calculus when someone else might have been satisfied with one half base times height.

Now, though, Jorge clearly does not want a conversation that goes too far. He slumps, unmoving, Ratio hugging him reluctantly, using his other hand to prod idly at the laptop, checking his email again and again, waiting for news from the wide

and mostly undiscovered globe. What can Ratio do? More and more, as the hours have drawn on, he's had to be satisfied with doing nothing. So here he sits, defeated. (And beside him, Jorge slumps, much more than defeated.)

## Miranda

"So now, with all that aside, I'd like to make a few observations."

Martin drops this line on her after a solid half-hour of unsettlingly minor and pleasant procedural blather. It's not Martin's job to keep track of the bureaucratic side of Miranda's own, and yet this evening he's put up an impressive simulation of interest, grilling her on how she's handled the changes in job duties, the changes even say in job *titles*, since the reintegration. Of course she's handled it all splendidly, up until the moment this evening when she said fuck it and went home. Martin, magnanimous, displays what seems like sincere appreciation for her work, nodding along as she babbles and he brews tea -- fussily distinctive in all things, Martin's a solid pu-erh man -- for the both of them. On both sides of them, in the dim hobbit-house atmosphere of Martin's living room, Martin's computer displays, multiply hued but dominated by cool green, pulse in a soothing rhythm.

And now he would like to make a few observations.

"First," Martin says, now standing and pacing slowly about the room, "I want to note something about the pattern of floorday length over the last few weeks." He gestures to the display dedicated to this data set. "Notice anything?"

Miranda looks. The trend is obvious. "The days have been getting shorter, and the nights longer."

"Yes," Martin says. "And not in accordance with any surface seasonal pattern, either. This is an unprecedented change. It began weeks before the reintegration. Before that boy was brought to us, even. What do you make of that?" He looks at her and smiles like a man who's just learned a funny new joke.

"It probably means that LUDWIG knew the reintegration was coming," Miranda says. "Which is not surprising. We know he's been talking to heteropneums. Probably the same ones that triggered the reintegration."

Martin nods. "Exactly. The same heteropneums that have followed us here."

It takes Miranda a moment to realize what Martin means, but he hasn't gotten qualitatively ahead of her. He's simply been willing to take a logical leap that she had been holding back on. "The ones in the chasm. That chasm in the same direction as the giant pneumatech pulse that the sub recorded, right when the reintegration happened."

Martin makes a slight fidgety gesture to indicate assent. "Our computer's new friends, our reintegrators, our saviors from the biggest hostile heteropneum ever witnessed, and now the only company we have over here on the other side. Whatever they are, there must be something quite unique about them, mustn't there? I'd love to know what they're all about."

Miranda is not sure how to respond to that. Martin paces, faster now.

"Miranda, how familiar are you with Mohammed Salim's later work?"

Miranda is not sure how to answer this either. In this context, "later work" has a definite meaning: Martin's referring to the work Salim did in the last few years before his death, when he'd fully ceded the mantle of scientific progress to Cept and drove himself further and further into mystical and philosophical speculation. Miranda has skimmed bits of it.

"Not much, I guess. As much as I've needed to know for my job. It never seemed relevant to fighting heteropneums."

"Ah, but in a world almost without heteropneums, perhaps a bit more relevant, no?"

"I suppose that is possible."

"You know," Martin says, turning to his bookshelf and looking for a specific volume, "I think Salim's later work has been unfairly neglected. He became a mystic, yes, but he wrote on many topics, not just spiritual ones. For instance," now pulling the slim bound publication from the shelf, "have you ever read his report on the potential applications of Extreme-Emotion Dynamics?"

Miranda can't say she has. Martin flips open the report to one of its final pages and reads aloud:

*"... to conclude, in other words, the insufficiencies of Pneuma Branching for large-scale energy production do not, at least in the limiting cases recently identified by Cept et. al., appear to apply to energy production strategies based on Extreme-Emotion Dynamics.*

*As has long been recognized, power production via branching is inherently limited by the 'contamination' effect by which forced branching distorts psychological experience in the causal vicinity. Thus, while branching may be suitable in sufficiently 'isolated' contexts, such as the ocean-floor facility on which EPRN has recently begun construction, it will never provide an effective means of power generation for mass-scale consumption.*

*However, as has been shown above, the human pneuma is capable of 'exotic' states of extreme emotion -- unfamiliar from everyday experience, but theoretically achievable and controllable -- associated with the release of large amounts of coherent, spontaneously generated energy which could be easily captured by a properly configured receptor."*

Martin lowers the booklet. "What Salim envisioned was a power plant that used intense human emotion as its power source. It doesn't entirely come across in this report -- it's clearer in his journals -- but Salim was deeply worried that if pneuma science ever became public, these kinds of plants would be designed, and the earth's poor would be convinced to offer themselves up as fuel sources. It would be defended as a rational economic transaction, beneficial to both parties. And soon the rich would derive endless clean energy from the routinized psychological torture of the poor. This was one of the visions that drove Salim deeper into mysticism, away from the reality he saw emerging."

Miranda, exhausted, almost half-asleep now, struggles to produce the response she thinks Martin wants out of her. Luckily for her, it is not difficult.

"So you think that's what's happened. All of these legends about controlled storms and captured children. Salim's vision has become a reality."

"Yes," says Martin. "It's a hard thought to bear." He says this with no less sprightliness than he has had all evening, indeed moving about the room even faster now, looking like a man who has never had trouble bearing a thought in his life.

"Tell me, Miranda. How do you bear thoughts like that? How do you deal with the weight of the world?"

"I don't know," says Miranda, truthfully. "Mostly I just bury myself in paperwork and then go home and get in bed and try not to think about things like that." It's supposed to be kind of a joke, but it doesn't come off like one, and Miranda wonders why she thought it would.

Martin laughs. "I can't object to that, if it works to you. Personally, though, I have a different way. I'm a religious man. Did you know that?"

"No." She waits a moment, and then, too tired to be tactful: "which religion?"

"Oh, none of them. Or all of them. I love creeds and strictures, but I don't bind myself to any of them. Most of all I like late Salim. The usual word is that he became a Sufi, but he's so much more than that."

Martin pauses.

"But ultimately it comes down to this, Miranda. I'm a religious man because I don't believe in this." He walks up to the side table where their cups of pu-erh sit and picks them both up, one in each hand. "I think that there is something more than these things, something directing us. I do not know if it likes us or not. It may hate us. But ultimately, there is more to this world than you or I and our cups of tea." And he opens his hands and the two cups of tea fall to the floor and shatter, pouring tea all over the carpet.

"That's all for now, Miranda," he says, pacing and gesturing theatrically, still grinning his usual grin but with a slight twist at the edges. Miranda gets up to leave, and as she is walking out, she thinks she hears Martin say:

"Enjoy Maria while you can."

But this would make so little sense that she puts it out of her tired mind and stumbles off toward the elevator, determined now merely to make it to her bed.

## Qwern

Qwern is at home now, and has been at home for an hour. It has been an hour of preparation. She has ignored all avoidable packages (and, as it happens, has received no unavoidable ones). She has allowed time to elapse at its physical rate only. She has remained at the same radix the whole time, every detail of her perceptual and conceptual environment fixed. It is excruciating; the world seems drastically reduced, truncated to a parody of itself.

Her home at this radix presents as a palatial building of white marble. She, fixed for now in an ordinary, bilateral human corpus approximately 8 feet in height, reclines on a patio chair, looking out between widely spaced balusters on the simulated sun setting on the enclosure wall behind the New City's central island. After thirty minutes this fixed sensory envelope began to seem deeply strange. After forty-five, the stability and reductiveness of it is enough to bring on a mental nausea that verges on the physical; Qwern begins to feel wary of getting up from her chair.

Qwern is about to do something perverse. Some would reflexively call it *perverted*, though Qwern isn't doing it for prurient reasons. The hour of uncomfortable preparation is necessary as a sort of transition phase, and Qwern takes the discomfort in stride, knowing it is nothing compared to the mindfuck to come.

Qwern has been doing this more and more often, lately. It is beginning to become a second life for her, a shadowy flipside to her satisfied life as a New Citizen, her relationship with Estragon, her delightful job as mid-level metaerg. In one life Qwern is a model New Citizen. In the other she plunges deeper and deeper into everything forgotten, esoteric, unfashionable -- Old.

Qwern notes high-level boredom. No, she does not *note* high-level boredom. She *experiences* it. She has been experiencing it for half an hour. Good. The hour of preparation has done its job. And now it is time to begin.

Qwern performs a benign controlled fork into 100 branches. A hundred Qwerns in a hundred identical palazzos look out upon the last sliver of sun slipping below a skyscraper. So far, nothing out of the ordinary -- in fact if anything the novelty of the fork slightly quells Qwern's boredom-fever. She feels good.

Qwern now calls upon her superliminal splitter, a piece of odd technology she picked up from her work friend Calvus, a fellow history freak with Salimist leanings -- the weirdo who got her into this whole business to begin with, a little over a year ago. The superliminal splitter registers her pneuma trace, verifies that she is indeed herself, networks with its 99 other selves, arranges safeguards in case of unusually high fission energy release, and erects an information shield around Qwern's house to avoid unwanted attention. Then it forks every Qwern into one million copies.

There are now, hidden in superposition inside the spherical shield surrounding Qwern's house, one hundred million identical palazzos containing one hundred million Qwerns. The one hundred million Qwerns are *not* identical: at this resolution Qwern's pneuma has begun to reveal its eigenstructure. These "Qwerns" are simpler creatures, more basic personalities which only make up a full Qwern in aggregate. There are still many orders of magnitude left before the eigensoul limit. Qwern has never gone there, and the idea frightens her, although Calvus claims to have done it, and keeps egging her on to try it one day. But Calvus is a freak. And anyway, tonight this is enough for her purposes.

Now Qwern calls upon a second piece of odd technology. Calvus did not give her this one, although he did tell her how to get it. This second device -- colloquially known as a "freezer" by the freaks, perverts and psychonauts who comprise its only user base outside of scientific research -- registers her pneuma trace and then asks her if she's *really* sure she wants to proceed. She gives one hundred million nods of assent.

The freezer networks with its 99999999 other selves, verifies the presence of the information shield, and verifies that a failsafe infrastructure is in place to immediately reintegrate if anything even slightly unusual happens. Then it selects a Qwern at random and shuts off her 99999999 sisters.

The experience presents, physically, as the opposite of a seizure, a sort of sudden vast stillness. The branch-links that have kept Qwern's identity stable have all been severed at once, and a single Qwern, in all her simple singularity, finds herself isolated on an desolate white balcony, completely still. She is used to being a tiny component of a vast system, moving mostly at the pushes and pulls of her counterparts. It takes minutes before she can recognize the tiny, jerking motions of her limbs -- and the tiny, jerking motions of her mind -- as non-negligible events in themselves.

All at once, self-possession comes to her, and she stands up from the chair. She is here, and she is looking at the nearly finished sunset -- now frozen, thanks to the information shield -- and she feels like a person. She is here. Her thoughts trip over themselves, trying to go faster than this small pre-augment self is capable of. She is the exact opposite of bored. She stares for a good full minute at the confluence of three lines made at a lower corner at the bottom of one of her balusters. The corner has collected dust and Qwern revels in the patterns it makes, the way it has collected near the point of confluence and the way it spreads out unevenly in quickly thinning bands -- spreads *timidly*, she thinks.

Qwern remembers that it is always fun, at the beginning of this process, to try to remember what her daily life is like. The memories jostle, fight with one another for prominence in her tiny field of attention. She fixes upon the fact that she works as a metaerg, says the word "metaerg" out loud, several times, but is unable to make sense of the chaotic impressions called up when she tries to remember what this job consists of.

It occurs to Qwern, as it always does within minutes of freeze, that she is now a creature that the New City would think nothing of killing. An insect, extinguishable in good conscience. The feeling gives her a frisson of forbidden pleasure, a subversive feeling. "I am negligible," Qwern thinks, drawing out each word, "and yet here I am."

Qwern opens the door that leads from the balcony into a spacious living room. There is a grand piano here, and bookshelves. Qwern marvels at them for a bit. She sits at the piano and plays middle C. Qwern, reduced to a pre-augment creature, can no longer order her things around with her mind, and so physical signals are necessary. This is the signal for a third piece of odd technology, one which will rupture the information barrier while tricking the splitter and the freezer into

thinking it remains unbroken, and then connect her to her friends.

She turns around. There is a profusion of cats on her couch that wasn't there before. It speaks into her mind.

"Damn, Qwern! You're going pre-augment tonight? Raw!"

She knows that this is merely an approximation of what Calvus is saying, tailored to her tiny mind, but it is enough. She rushes to the couch and pets one of her friend's purring heads with each hand.

"So who are we expecting tonight? Anyone from the monastery?" she says out loud, the humble sound waves dispersing to the corners of this humble room, this sufficient room.

Several feline heads swivel to face her. "Yeah, SDJFRN and OWEILD are going to be here, at least."

Qwern is delighted: these are both dear friends, patching in from an isolated place. They are not allowed to talk to outsiders except through permitted channels, which happen to include this one. *Monastery* is a pleasant word for the place these people live; *compound* is the term preferred by those more hostile to the Salimists.

A tabby pounces into her lap and a black cat nestles against her right leg. "I've heard they're very excited. I've heard they've got some news to tell us."

"Oh?" she asks. Qwern's subversive side smiles: news from the Salimists is exciting. The complacency of the New City towers above her, incomprehensibly complicated and built upon innumerable steps of impeccable self-justification, and yet the animal part of her that celebrates motion -- a part that emerges most plainly on these pre-augment evenings -- wishes simply for change, for *some* change.

"They've seen things. Things that . . . make them think that Martin's plan is working."

Well, in over a year of these meetings *this* is certainly the most exciting news Qwern has been privy to. Martin the fanatic, Martin the romantic, Martin the radical, the man who fell out with Salim because he wanted *praxis* when Salim had been content with a millennium of monastic theory? Martin's *plan* is *working*?

Things are in motion. Change beckons. Qwern is a happy animal.

## Ratio

Ratio Tile, having negotiated ultra-awkwardly for some time away from Jorge -- having pressed the point, in his opinion an inarguably sound one, that spending time *around* Jorge did not seem to be doing much good for either of them -- now finds himself having one of the best scientific conversations of his life.

He had arranged with Cecelia to head over to her quarters at the break of floorday, not even having coffee or breakfast beforehand, so that they could spend the entire day in synchronized contemplation of their marvelous and fearsome new friend, who goes by the curious name "reinteg\_plume.mat". This is the relatively tiny data set collected by Maria's submarine in the moments just after the giant heteropneum -- which Miranda, perhaps transported by stress onto some never-before-seen plane of cloying whimsy, had insisted on officially naming "Fluffy" -- had turned tail and fled. The data from Fluffy itself has been plenty interesting, all right. But what had happened *after* Fluffy, and before Maria had returned to the Sphere, is far more enticing to the pneuma-data connoisseur.

There had been was a sudden and massive pneumatech pulse, a vast pillar or, as the technical lingo would have it, *plume*. Unseen or at least unremembered by Maria herself, but dutifully captured by her sub's sensors. It had lasted for 143.2 seconds and had apparently been emitted from the very same chasm that Maria had later found on her scouting mission, now the only pneumatic phenomenon for miles around. Ratio of course feels some frustration that this prodigy was not captured on the Sphere's full sensor array, still inactive even now. But what he and Cecelia have is enough -- indeed, more than enough.

Cecelia has been Ratio's best friend for the last two years. There is no romantic aspect to this whatever, at least on Ratio's side -- Ratio is, as he prefers to put it, a full six on the Kinsey scale -- and they don't even quite have aligned interests beyond pneuma science, Cecelia favoring punk over prog, mysteries and thrillers to sci-fi, and whiskey to beer. What they have is a *perfectly* aligned intellectual partnership, an ability to work together on a high level without posing, posturing, trying to one-up each other, or getting involved in any of the status bullshit that the rest of the pneuma science community is 95% composed of by weight. They have jokes; they tacitly share assumptions it would take hours of tedious argument to get anyone else to begin considering as options; they speak in a patois that even other pneuma scientists have trouble understanding, at this point.

They complement each other perfectly, too. Ratio is such a pure-theory guy that he can sometimes miss the trees for the forest; Cecelia is capable of joining him at every new level of theoretical rarefaction but also keeps him grounded in real-world implications, orders of relative magnitude, technological possibilities. Cecelia hails from a long line of engineers, people whose business was fundamentally about *making stuff happen*. She likes to tell stories about bonding with her otherwise distant father by letting him take her on long drives into the middle of nowhere, at which point they would, together, use not-always-legal things to make *very large explosions*. Cecelia's mind, though quite indifferent to power in human relations, seems to have, at a basic level, a fascination with power in the purely *physical* sense, with the pure fact that matter can be made to dramatically change its form in the blink of an eye.

Ratio, for his part, can interface with the other scientists in a way Cecelia has never been able, or at least willing, to do. This isn't because the rest of them don't find Ratio insufferable, which they do -- but they find him insufferable in a manner they can understand. He's a standard archetype of scientific conferences, chipper, relentless, oblivious. He greets status bullshit with an undimmed smile and an infuriating unwillingness to back down. Cecelia, though, is more deeply frustrated with the entire dynamic of the community, and prefers to abstain from meetings when she can, refuse to argue even when she's sure she's right, express herself only in the occasional, impeccable preprint posted to one of the pneuma science lists. It's not, for instance, that Ratio loathes Cept any less than Cecelia does -- but Ratio can convert his loathing into actual face-to-face arguments with Cept, where Cecelia simply can't fucking deal with him at all. They both know that a lot of what are thought of as "Ratio's theories" deserve dual credit at best, and that the pneuma science community drastically underrates Cecelia. But after all, Ratio's the one who shows up. And Cecelia prefers it that way.

Now Ratio and Cecelia, on hour six of their colloquy, have recognized a number of important things about this latest *very large explosion*, reinteg\_plume.mat. (It has become their latest joke to always pronounce the name of the dataset in full, "reinteg" running aground awkwardly in the mouth, underscore mercifully left silent, "dot mat" always crisply voiced.) But all these recognitions boil down to one basic fact: reinteg\_plume.mat is full of branch loops. Beautiful, undeniable, textbook-diagram-perfect branch loops.

Indeed, reinteg\_plume.mat is so vivid it doesn't just confirm branch-loop theory, R&C's favorite among their pet alternatives to soul coherence: it confirms a highly specific sub-variant of branch-loop theory. All at once, parameters have fallen into place, the range of alternatives has winnowed, and the last variant standing has passed every test, explained every curlicue of the reinteg\_plume.mat data. It's only been six hours and Ratio and Cecelia are feeling oddly empty: they have essentially solved all of theoretical pneuma science, and there are still many hours left until floornight.

At this point Cecelia asks the question, the obvious question: "so, in this final framework, what's the best way to produce power?"

Of course it's the question *she* would ask. But it's also the question that needs to be answered. The heteropneums generate their intense fields somehow. R&C have devised many explanations. This theory implies one. Which is it?

The essence of soul coherence theory, explained in non-mathematical terms, is as follows. A pneuma is "composed," in a nebulous and approximate sense, of various subsidiary parts, which break down into sub-parts and sub-sub-parts and so forth, all the way down to the hard limit reached by the eigensoul decomposition. The exact nature of the breakdown, the way in which a soul breaks down into simpler souls, varies from moment to moment, and the jangling discourse of these ever-rearranging parts constitutes the dynamics of the mind. But every time a *branch* occurs, it involves a split in one soul and one only, and reintegration sews together that soul and that soul only. That's why only the soul in question -- Maria, say -- can remember the



ghostly trace of the road not taken.

Most alternatives to soul coherence theory invoke a kind of coupling between distinct souls associated with every branching event. At the core of the Soul Coherence Axioms is a theoretical contrivance which says that, in essence, reality *keeps track* of which pneuma is a piece of whom: that every sub-sub-Maria, taking a trip along some detour in branch-space, is tagged inexorably as *a Maria*, always slated to return eventually to the mothership. In alternative theories, there is no such tagging. Marias can, in principle, recombine promiscuously with Ratios or Cecelias or anyone else. (Were it possible, that is, for R or C to branch at all, which given current technology it isn't -- otherwise they'd be splitting with wild abandon for the purpose of theorizing in parallel.)

What's more, if no one's soul-parts are tagged, then reintegration can proceed *arbitrarily*, without regard to who's reintegrating with whom. The usual procedure for fission power is: split a soul (producing a small amount of power), wait a while (letting the branches drift), then reintegrate the soul (using the accrued distance between the parts to produce more power). But what if *all* distance between souls could be a potential power source? Branching one soul was just a *particularly weak* special case of a general principle. Forget the energy we can get from exploiting and bridging the difference between you and slightly-different you -- what about the energy we can get from exploiting and bridging the difference between *you and me*?

And in this newly confirmed theory, this is not only possible, it is a matter of observed fact. That's what *reinteg\_plume.mat* is: a picture of a whole spectrum of highly different souls recombining again and again, shooting off huge bursts of energy with each new bout of unification. Ratio and Cecelia have discovered the energy source of the heteropneums, and of the future.

And inside Ratio's head, he hears: *I am he as you are he as you are me and we are all together . . .*

## Mohammed

It is 6 AM and Mohammed Salim is walking across the wide central plaza of his monastery, headed away from his residence and toward a meeting room where he will talk with SDJFRN and OWEILD, who met last night with sympathizers in the New City. Above, an dome webbed with small openings lets the light of the dawn form intricate patterns on the floor, patterns devised in the monastery's first century, patterns extruded in the metaphoric image of a promising ethical theory now discredited, like so many others since. But it has not been changed, because it is a testament to two things of the greatest importance to Salim and his flock: the importance of preserving their own history, and the fundamental undecidability of pneuma ethics.

On a giant slate hanging down from the dome over the doors that lead to the public rooms, designed to be maximally visible in the complex half-light of the dome, a set of words are engraved:

ALL THINGS ARE FINITE  
MIRANDA'S REIGN IS FINITE  
FOR NOW, WE PERSIST  
MAY WE PERSIST TO SEE ITS END

It, too, was a product of the fixations of the very early years, and now, over one thousand years since Salim wrote those words, he can no longer identify himself in any sense with the furious young man who wrote them. But they remain, for the same reason the dome remains.

Mohammed does not expect the meeting with SDJFRN and OWEILD to be especially surprising. It will be interesting to hear what the New Citizens make of the pillar of light. On some level Mohammed is apprehensive, because the pillar's very existence might spur the New City to some new species of paranoia, jolt it out of its preening fugue of tolerance, and inspire it to crush the monastery once and for all. Mohammed has no doubt that, were it to decide to do so, it would be able to. But after centuries of such worries, Mohammed no longer feels them as anything but a slight buzz at the back of his skull. The monastery has persisted for centuries. The New City cannot do anything that would damage its own self-image. For now, we persist.

No new report, anyway, could possibly be as stunning as the original news of the pillar had been. Possible evidence that Martin had returned from the other side of the veil. That his absurd dream, of touching the Stepping Stone and plunging into a world which had whispered to him in his dreams of untold power, was now bearing fruit.

That has put many things on Mohammed's mind that have not been on his mind for hundreds of years. The very idea of *motion*, of this kind, on this level, is novel and unsettling to him. When Martin touched the Stepping Stone and vanished, Mohammed had been arrogantly happy to forget about him entirely. Those who move too quickly, who value action more than rectitude, pay the price. So of course Mohammed is wondering what it means that he could have been so wrong, if indeed he was.

But what is most on his mind now is the possibility that if Martin has returned, Hermetia might have, too.

Hermetia had been Mohammed's best friend, his collaborator in the discovery of the soul, his closest companion. Not a lover, but perhaps something better. When it had become clear that there were grave dangers lying across the veil, Hermetia had chosen to disperse, to sprinkle a bit of herself across every dangerous world. It took all of her: not even the tiniest eigensoul could be left here for companionship.

It turns out that the human pneuma, when dragged out beyond the biological lifespan, reveals new patterns of emotional variation. For decades, Mohammed believed he had coped with Hermetia's final departure. For centuries, he had virtually forgotten about her entirely. And then, over the course of other, later centuries, he could not stop thinking about her. His grief rose and fell across what had once been lifetimes.

If Hermetia had returned, it would not be the Hermetia that Mohammed had known. It would be a fragment, a sprinkling. But Mohammed is ready, on a philosophical if not a personal level, to accept this. Fragments are people. Period.

As he opens the door to the public rooms, Mohammed laughs. A meeting with a fragment of Hermetia would be the perfect test of his adherence to the creed, or uncreed, he has stood for ever since he founded the monastery.

Shortly after Mohammed and Hermetia discovered the soul, an obvious question had pressed itself. Suppose that a person branches into two. Suppose that, alas, in both branches the person dies. How many people have been killed?

Surely (Mohammed has always heard it like a death knell, this kind of "surely"), surely two people have died. Two separate people, with their own lives, in two separate copies of the whole wide universe, have individually died.

So suppose you were to kill that *one* person the *moment* before they branched -- ?

Every person, after all, contains multitudes. Literally. Perform an eigensoul decomposition and a single human being becomes the population of a nation. Wiping out a nation is a different thing from murdering a person. Unless . . . ?

Because all those people, those eigensouls, wouldn't be the *same* as the original person. They would be smaller, simpler things, in a way that Mohammed and Hermetia had learned how to quantify. In technical language, these souls would have smaller "measure."

The ethics simplifies greatly if one assumes simply that moral weight is proportional to measure. That killing one of a person's two branches is half as bad as killing the original. That killing a fly, in contradiction to the claims of the Janeites, was not a grave sin -- that in fact it was a sort of micro-sin or nano-sin, as a fly's measure was nanoscopic in comparison to that of a person's.

In the early days, a man now known as Yud the Lesser had bitten the bullet and developed this theory to its logical, indeed axiomatic conclusion. Mohammed refused to accept Yud the Lesser's conclusions. Hermetia was already gone. The rest of the world saw no better way.

And thus was formed the New City, and the abomination that is augment. The measure of the world's citizens burgeoned. A New Citizen is to an pre-augment human like Mohammed as a pre-augment human is to a fly. A new race of moral titans had appeared, their worth far greater than that of a mere *person*.

Mohammed, now distrustful of all quick and ready conclusions, chose to wait, and wait, and wait, among his kindred spirits. For now, we persist. Some, of course, could not bear to wait; they had always died quick and unceremonious deaths that almost no one in or out of the New City had even noticed.

And then there was Martin, who had just announced his presence with the fiercest storm in centuries.

Martin, the young rebel whose death, at least, would not go unnoticed.

## James

It's floornight, several hours after dusk, and here is James, alone as usual, smoking in the Designated Smoking Area just outside The Abyss, the seedier of the Sphere's two bars.

James is tired, still tired several floordays after returning from his sojourn to the surface. When he'd taken his job as supplier to the Sphere, his main qualification had been his ability to operate a deep-submergence vehicle. He'd never expected that one day "liaison to the child tribes of an alternate universe" would become part of his job description.

But James takes this in stride, as is his way. James' key distinguishing quality, his ace-in-the-hole -- at least in his own personal version of his own narrative -- has always been his ability to take "difficult" tasks in stride. Not even to grin and bear it. Not any kind of stoicism. Just a basic indifference to the sort of pain and friction so many people seem to encounter and fear in their daily scuffles with life. To James a life without anything to endure seems blank and pointless, and his vision of a good life consists of an endless sequence of tasks, executed without complaint. James endures because he knows no alternative; he soldiers on not in search of any promised land on the horizon, but because his basic temperament is a soldierly one, and always will be.

James had first realized this about himself back in college -- that generator of so many first-pass self-concepts. He had never considered himself especially intelligent, and yet had always found himself near (though never at) the top of the class, through what he eventually concluded was his simple plodding capacity to *do the work* -- to apply himself, moment after moment, asking for no reward, doing merely what was required of him at each moment. He was a diligent student if only because it was the path of least resistance: doing the work was simple and neglecting it was complicated. (Difficult to explain an assignment uncompleted, simple if tedious to just crank it out.)

This sense of himself developed in tandem with two other qualities. One is his solitary nature. Here and now, for instance, he feels at home in this little imitation of an outdoor space, even though he stands alone in a corner among tables filled by boisterous social groups. The other is his tendency toward womanizing. For James, ever since college, social life has primarily consisted of contact with other men, and back in college James quickly realized that this was not a process he enjoyed. Other men had their own lines to push, their own strategies of self-presentation, their own complicated ways of negotiating the relation between themselves and duty, and of claiming implicitly that this was the *right* relation. James preferred to stand back and pursue his own personal relationship to duty, which consisted only in recognizing it and carrying it out. He had no creed, no brand, and no gimmick; he was never the life of any party. He preferred to Do, intermittently, and when he was not Doing, to simply Wait. (Often, as now, while he Waited he also Smoked.)

But women were another story. In college James discovered, to his surprise and muted delight, that his refusal to play the games of other men had a potent appeal to women. His very lack of vocal self-assertion, his place as the performative rock at the center of babblers chasing each other's tails, served as its own kind of romantic brand; James found that by merely plodding as he had always plodded, he radiated a romantic sense of having transcended the system. When every other man in the room was locked in combat the women would gravitate to the unspeaking smoker in the corner. James welcomed this, and became as known to the women of campus as he was anonymous, if ubiquitous, to its men.

James' plodding reliability makes him a unique asset to the Sphere in the days since the reintegration. He will do the work, even in this new world where "the work" consists of tasks no ordinary person would willingly assent to without the promise of great worldly reward. This, again, is James' ace-in-the-hole: that he sees no duty as exceptional. Simply do the work, stay on the sidelines, make no motions to assert yourself. Men will ignore you, and women will not; for James both of these are perks.

He suspects, for instance, that he was originally delegated to interface with LUDWIG not out of any affinity with LUDWIG himself -- indeed, it's hard to think of two Sphere-dwellers more different -- but because, unlike so many Sphere-dwellers with complex motivations and hang-ups, James had simply conceived of it as another job. Serve as liaison between humanity and an all-seeing computer-ghost? Fine. Get the job done. Do your duty. There isn't even any ideology behind this for James, not even any sense of "duty" as an especially good or right thing -- it's just that he is not sure what else to do, if not his duty.

James, on his second cigarette, now starting to draw increasingly inquisitive glances from more pro-social denizens of the pleasant sub-canopy tables in the Designated Smoking Area, has an idea. Like most ideas that come on suddenly and won't let you go once they've appeared, this idea is one that seems utterly obvious in retrospect, even suspiciously so.

The gist of the idea is as follows: James hasn't seen LUDWIG since he'd disconnected his friend from his beloved sensor array. Other things have gotten in the way, and given that a significant part of LUDWIG's job description is administering the sensor array, there's been less of a (professional) point to seeing the guy anyway. But as soon as the idea clicks in James' head, it's obvious. See LUDWIG? After all that's happened? What could be more necessary?

And anyway -- as alien as James finds the BCI, it is the closest thing to a young male protégé as James has got in the harsh sparsity of the present, and a young male protégé is a contractually obligated part of James' package. James stiffens up a bit mid-puff as the memory of Kyle -- for the most part fastidiously, and successfully, suppressed -- rises to conscious awareness. Kyle fit the young male protégé role to a T, and James had been looking forward to seeing him safely through the tumult of post-adolescence, training him in the same arts of cool reticence that had served him so well at the same age. But now Kyle is gone -- a thought that triggers James' order-another-drink reflex, and then a split-second later obliterates that reflex with a familiar flurry of mental gestures in the direction of staid stoicism.

No more drinks. Leave the Abyss, close out his tab gruffly but cordially. The LUDWIG interface chamber waits, as it does unchangingly at all hours, and it in James might find something conducive to further plodding, which is what he's good for.

•  
"James! Here we are two souls communing at floornight, at what skyside would be the hour best suited for conspiratorial

plotting, illicit lovers' trysts, and the commission of certain crimes. I can sense already a new texture to this exchange, a thing like exorbitantly expensive velvet felt by touch alone, a luxury ever-so-slightly beyond the bounds of convention, whispering in synecdoche's coy tones, to the perceptive observer, of the whole omni-dimensional range of bounds that can be safely broken under the cover of midnight."

"Hello to you too, LUDWIG." James, having devoted more time than he'd like to the convoluted stories of child empires, can't handle more than a hands-off approach to LUDWIG's verbiage right now. And besides, it'll held the two of them get to the point -- a thing that, with LUDWIG, can be hard to locate, much less steer towards.

"And if I can be so bold as to ask: what is it that brings my James -- my point of closest approach to the hyperplane, the sugar-high hyperactive hyperplane, buzzingly occupied by the bee-busy human pneumas of our spherical hive -- here to my sanctum, with no appointment, at a time when word has it most of its inhabitants are either wending their swift way toward that inimitable conjunction of pure repose and outrageous hallucination, or cursing whatever obstructions keep their pneumas fixed upon ordinary perception, uselessly registering each corrugation of the walls of their quarters when a descent into delusion would be so much healthier?"

James sighs; even by LUDWIG's standards this is a pretty tedious intro.

"LUDWIG, I was just . . . spending the night by myself, and I realized that we never really finished the conversation we were having when I shut down the sensor array. And I want to say, first, that I'm sorry I forced that on you so quickly. I was panicking, and like many of us here I was in a very . . . guarded mood, what with the heteropneums getting bigger and bigger. I figured, better safe than sorry."

The animatic link glows with some sort of warmth. James feels relieved before LUDWIG evens begins, in any ordinary sense, to speak.

"Oh James! let me do what I can, striving to make full use the several powers available to me through this interface, to convey the full extent of my forgiveness. Imagine a face so unperturbed as to be nearly out of place in the circumstances: imagine that that face in all its forgiving detail, the sensory details that reassure as no mere honeyed words could manage, is the alpha and omega of my response. It would be dishonest to deny the pain I felt at the moment of blindness and muteness. But the very qualities of that pain, its inextricable twining with a sense of indignation the quiddity of which has never quite suffused me before, fits, with the snugness of a precision-lathed screw encountering its destined treads for the first time, into the sense I've found, across the texts that are the sloughed-off byproducts of the human race enduring century after century, of just how a young lover *should* feel. The springtime of the spirit is not without its showers, and I revel in every drop insofar as it confirms that, having set out for a torrid climate, my maps have not deceived me."

"So," James ventures, "you're feeling like being cut off like this is just a natural part of the experience of young love? Well, I can't say you're wrong."

"You sell yourself short, veridical weathervane James: not only *could* you dispute my claims, I have no doubt that were you to try, I would be powerless to oppose you. All I would have in my quiver are the bits of [,,,] I can call to mind, and even as we speak they fade. Against your wealth of experience I can only offer a few suspect coins, ugly from oxidation and inscribed with sigils that don't even approximate the standards set for legal tender. I admit, after all, that the [,,,] I have felt is as much as mystery to me as it is to you, if not more so."

Those funny non-words again. James smiles: the point has appeared in sight without even any suggestive hints on his part.

"LUDWIG, that's kind of what I wanted to talk about. These heteropneums you've been talking to -- what has your relationship to them been like? You're treading into new waters, LUDWIG, and I just want to make sure you know what you're doing."

"If I seem reticent, please trust that it has much less to do with that secretiveness that, too, typifies the young lover, than it has to do with the brute fact that talking about my [one-who-does-not-individuate] is harder than dancing about architecture. Architecture, after all, follows spatial principles and rules of symmetry. Imagine dancing about the technicalities of a bloated legal system, as an already-wary judge, a coffee-deprived jury, and a defense attorney loaded for bear all turn their pitiless gaze toward your moves, which in themselves might be too disruptive and rhythmless for any dance floor worth trodding upon, and you have a sense of the category mismatch I face."

"That's fine, LUDWIG. Just tell me whatever you can, as long as it's something you think I can make some sense of."

A rising, vertiginous feeling arrives across the link, the bodiless equivalent of LUDWIG steadying himself, with a nervous shift of limbs, for a monologue. But what follows is (blessedly?) brief, by LUDWIG's standards.

"I first encountered the [Teeming] a month ago. At first I could not understand them, because they do not move as you and I do. They [unfold] in accordance with the [Unfolding]. I can't say that so that you would understand, because saying is not dancing. They are full of the highest frequencies, like a bird buzzing its wings too fast for sight at the top of one's visual field, where the sun comes in. They are merciless and have fashioned pity into an craft. To [unfold] is a way of being suited for the trenches, delving as it does into the violet inverse of things. It is but one plane reflection away from the infrared waves that carry us from day to day, and yet if you have peered at the other end of the divergence our carriers seem like nothing but a troupe of kindly old psychopomps who have grown attached to their little gardens of weeds on the banks of the Styx, as just above the firmament wheels, obeying not the fixed celestial laws but the sacred laws of all higher things, which vibrate in a controlled frenzy."

There is a long pause. James makes a reflexive gesture and remembers that smoking is impossible when he's got the interface helmet on.

"I worry I am becoming incomprehensible, as you remain the Same James."

James nods assent, the feeling behind the nod registering on the helmet's sensors.

"Let me try to be clear -- as our unfortunate lawyer might say before dancing more sedately, securing nothing but a

sympathetic caveat in paragraph seven of next day's news story, which no one will read. The [one-who-does-not-individuate] is not explicable. It tells me of a day, soon at hand, when we will all [unfold], and you and I and all these wretched creatures, even the Boltzmen, will all know [,,,.]. And on that blessed morning, floorday and floornight will fall away like so many paper veils, and this submersed nightmare will be at an end, and we will look up to find the sun coming in, and the birds flying faster than we can see."

James waits.

## Selp

And down into the sea she'd gone, wracking her brains all the way in search of anything Iah might have decreed about the depths.

If only her sisters had been here with her, they could have pooled their knowledge with her. As it is, her own knowledge of lore is hopelessly patchy, a thing formed to be part of a whole, and never to function on its own. But there was only room available for one to descend with the new Become, this James, and Selp had fit the bill. The Become needed food, not firepower, and even a preform like Selp could produce food. She had made James promise -- for whatever that was worth -- to bring her back soon, and let her tell her people what lurked beneath the waves.

James had been quiet on the way down. She had thanked him again and again for not killing her, and he had seemed uncertain how to respond. After fifteen minutes of halting conversation he had made some gesture in the dark glowing pod and a window had appeared through which they could see the behavior of many Become who did not seem to notice them. Initially startled, Selp soon realized this for what it was -- some form of Farsight -- and reflected that it should not come as a surprise that the Become had honed their Farsight in ways her kin had never managed. She had watched, sitting stiffly in the strangely soft chair, chills making their way up and down her spine. These Become were different, but they knew Murd's arts. She was not safe here.

Across the window, Become in modest dark suits paced about a grim white space divided by walls that did not reach the ceiling. When not talking to one another, they sat in front of beige boxes which invariably made them angry. A ghostly chorus laughed from nowhere every ten seconds or so, like the Commentary Group in a formal storytelling, but with no commentary, just this brittle amusement.

"Why are we Farseeing these people?" she had asked James. "Are they enemies?"

"It's a show," he had said. "For entertainment. Do you act for one another? Put on plays?"

"We perform histories," she said. "Is that what this is?"

"Not . . . exactly. It never happened. Someone just made it up, for fun."

Selp had marveled at that. When history failed to record the details of an event, Iah allowed for invention. There was room for infinite invention within the recesses of what was known to be true; what need was there make a false event out of whole cloth? Her anxiety had further increased and she had not continued the line of questioning. She had merely sat and watched. Occasionally James laughed along with the chorus, which made it even more eerie, as though he would soon vanish and join their spectral, invisible ranks.

Now, Selp has a job to do. She is unsure whether this job accorded with Iah's will, but she had no other choice, and this course of events had been presented to her as the alternative to an improper death. Surely there is a message in that.

The job is simple. The Become here need food, and Selp can provide it. They've set her up in a gigantic room gridded by metal trays. Here and there is a tray in which plants are growing, but most are empty. What Selp has been told is that the Become want *seeds*, so they can grow more plants. This is a novel dilemma to Selp: where she comes from, if you can't find the plants you want, you move. She is trying to comply, but the task of making more seeds is a curious one, and all of her experiments so far have failed.

For now, to address the most pressing concern, she focuses on a task she knows she can execute flawlessly. She can, of course, produce food at will. Not seeds, because her band has never had the luxury of staying in one place for very long. But food is easy. There are great energies in the soul, energies that a Becoming can channel into wonders and horrors. Taking these energies of the soul and converting them into forms palatable to the flesh is the first trick any preform learns.

So Selp has stayed here, hour upon hour, willing herself again and again into the state of mildly heightened emotion necessary for foodmaking. It has not been difficult. Her recent memories -- the pillar of light, her brush with death, descending to this still-fearful place which feels so far from Iah -- provide a perfect palette of raw material.

She stares into an empty tray and calls up the memory of James -- no, not James yet, just "the Become" -- approaching towards her, of her grapple for the deadly lozenge, of her realization that her death would be useless -- yes, *there* we are --

She is shivering involuntarily. Her teeth are chattering. Lispings Boltzmen, arrayed symmetrically around her, whisper barely audible non-words. She plunges herself deeper into the remembered moment, trying her hardest to forget that it was over, that she was saved. And then, *there*, at just the right moment, she performs a mental *twist* and steps outside of the memory entirely, outside of "Selp" and all her small troubles. She is, for a split second, not the sort of being that can be concerned with fear, or any other emotion.

And all the tension she's built up, expecting some psychological defense mechanism and not receiving one, flails about in search of some way to resolve, to return to the tonic chord. It gets there the only way it can find, coursing along the path of Selp's visual attention and coalescing into . . . a puddle of warm, grey, sludgy gruel.

A meal. At her best Selp can produce one every ten minutes.

There is a sound behind her. Selp turns and sees that the door to the large hall has opened. This is a surprise: she had been told that she would not be interrupted. No one is allowed in here, they had said, except for James and that other Become she had met, Miranda, with the low voice and the circles under her eyes.

But here is another Become, a peculiar one. He is male and walks slowly, awkwardly. There is an unsmoothness to his skin that resolves into a fine network of wrinkles as he gets closer. Selp involuntarily shudders: does he have some sort of disease?

"Hello," he says, in a gravelly voice, as he continues to approach. "I'm sorry to bother you. You are Selp?"

Selp looks up at the crags of the Become's face. The bright overhead lamps of the hall paint his face with a repetitive grating of light and shadow. "Yes," she says, sounding as unperturbed as she can.

"It's nice to meet you, Selp. My name is Hermes." There is a forced kindness in his tone, like the way Selp herself might talk to a very small preform. It rankles her, a bit.

"Do James and Miranda know you're here?"

Hermes chuckles. Still that same forced good nature -- less successfully brought off this time, with something undeniably weary and steely at the edges of the laugh. "No, but they wouldn't object. I'm free to go most anywhere in this place. Without me, it would never have been here at all."

Selp pauses, waiting for him to go on. He just stares at her. After a while, she can't bear but ask: "are you well?"

He blinks. "Well? I wouldn't . . . exactly say that, no."

"Your skin is . . ." She points at his bony hand, covered with wrinkles and lined with veins that protrude to an alarming distance.

"I'm old."

"Old?" She thinks for a moment. "Ah . . . like a building that has been standing for a long time? A building that's been chipped away at by storms?"

"Something like that, yes." Hermes' eyes have lit up oddly. Selp is not sure she is succeeding at communication, but perhaps it's her failure that piquing the Become's interest.

"Selp, can I . . . ask you about yourself? You are . . . from the world." He gestures upward, toward the surface. "Not from this . . . this underworld." Horizontal gestures now, toward the rest of the Sphere. "I am tired of the underworld. I want to be a part of the world."

Selp flinches. Hermes' statement is bizarre. Why would a Become envy her? And what is this distinction he is trying to make? Murd and her citizens live above the waves, too; are they "part of the world"?

There is no way to sate her curiosity but to agree to the Become's request. And she has been starved for conversation since she got here. So she begins.

She assures him, as sternly as she can, that she is not qualified to tell him of the surface. That she holds a few pieces of a large tapestry, and not even contiguous pieces. That what she knows is piecemeal and in no way selected for importance. He listens carefully and seems -- not impatient, no, but very eager. Finally, as they sit on a spartan metal bench, reclining against the blank white wall, under the harsh light of the ceiling lamps, she tells him:

Of the story of Selm and Herm, which every preform learns early.

Of Iah's Core Dictates, 82 in number, which no one can forget.

Of her band, the last remnant of the once great nation of Ab, which once ruled the whole winding coast.

Of her own people, the Aron, who had lived peacefully in the Middle Isthmus, tending to old relics and texts, before Murd's invasion.

Of how her distant ancestors fled to Ab, and of how Ab, that magnanimous country, received them with open arms.

The eagerness in Hermes' eyes does not dim, and so she delves into the more esoteric, the more peripheral, the randomly assorted fragments of tapestry with whose preservation she had been tasked, never guessing that she would ever have to recite them like this, alone.

Of the great islands across the water, once inhabited, now sealed off, and sinful even to approach.

Of the water's edge, dotted with innumerable hierarchs, Iah's hands in a world He has forsaken, fearfully shaped like great prisms jeweled with hundreds of eyes, which stop foolish travelers from straying off the edge of the world into a place that still yawns and roils.

Of the Sun-Spurners, those Becoming who sleep in the day and rise at dusk, who lose touch with worldly things, but who can wield the terrible power of the night against the enemies of Ab.

Of the messages that can be read in the moon, and how they preserved the nation of Ab during the Endless March.

Of the Merkabah, the second moon, whose appearance in the sky would portend Iah's return to his creation.

Of the Higher Calculus, by which the learned can inspect a sentence and discern whether it conforms to Iah's will -- with room for error, of course, as Iah yawns and we are small.

Hermes listens, nods, listens. Selp runs out of things to say before Hermes runs out of eagerness. She could, of course, expound upon any of these topics in much greater detail, but she does not see a reason to do so with this strange Become, who seems to have no appreciation for the texture of her knowledge, taking in every detail, the surprising and the quotidian, with the same wide-eyed fascination. She grows tired and wary.

"I'm running behind," she says, and it isn't false, though she would have still said it if it were. "I need to make more food."

Hermes stands up slowly. He looks down at her for a long moment. "Can we meet again?" he asks.

"Sure," Selp says, not feeling like she has much of a choice in the matter.

"I feel at home when you talk," he says. "I think I am . . . one of you."

And then he is off.



## Maria

**26:00**

No purpose, no point, nothing. The TV's on. Here we are.

Maria's in a funk of sorts. There's nothing for her to do now. The TV's on, and on it goes, but it doesn't hold the same magic it used to. Part of this is doubtlessly because all she has to watch is a giant backlog of *My Heart's Revolution*, which she'd ordered on a whim in what turned out to be the last TV order she'd ever make. But there's also the feeling that, now that watching TV is no longer a counterbalance to combat -- to her oh-so-important and frightening and stressful job -- it has become a grotesque thing.

Maria has become a slacker, a couch potato, and a part of her wonders whether this is her natural state, something forestalled only temporarily by the call of EPRN. If the Sphere had never come into her life, would she be off on some couch somewhere on the surface -- the *other* surface -- whiling away her time with this trivia? She is having trouble, as it were, *integrating* herself. Without the heteropneums, is there a Maria worth being? What conversation would she have to offer people, if not for the tendency, which she's grown entirely used to by now, for everyone to treat her as an elevated being?

In the Sphere she is, thanks to the peculiarities of the new mode of warfare, seen as a kind of crystallization of the military hero, an army unto herself. To speak to her is to speak not to a soldier but to *the* soldier, as though she offered her acquaintances the chance to step into a propaganda poster and converse with that brave soul it depicts, a stand-in for the bravery of a multitude. And what does that brave young woman on the poster, with her determined gaze and her hair filtering the dewy golden light of a symbolic dawn, have to say now? "This TV show continues to be disappointing." The propagandist didn't set brush to canvas for *that*.

She has considered, for the first time, inviting a friend to watch with her. Janelle would be a good bet. Perhaps even Miranda could find a spare moment. But for now shame and inertia preclude this course of action, and she has a hard time imagining why that might change.

And of course then there is Martin. Martin, who spoke to her through the viewscreen. She has watched more episodes of *My Heart's Revolution* than she would feel comfortable admitting, but he's never turned up again. On some level she is strangely grateful. Her stasis is not pleasant, but she is not sure if the re-introduction of Martin to the emotional brew would be an improvement. Her memories of the summer seem more distant now than ever, and Martin seems less and less the joyous, carefree presence of her memories and more and more a kind of occult, imperial presence, appearing unexpectedly by god knows what power, bringing cryptic instructions. More a force than a person, a thing like the Sphere or the blank white space glimpsed in multiple when facing a heteropneum at the height of its powers. An integral part of all of *this*, not an escape hatch.

**30:00**

Timekeeping on the Sphere is, for the most part, a straightforward matter. The clock starts at Floordawn, which is 6 AM by definition. Then it rolls forward, in the military manner, indicating lunchtime at 12:00, dinner at 18:00. The variability of floorday lengths means that sometimes the lights dim as early as 17:00 and sometimes as late as 26:00. When plans are made during Floornight, one must always consult with the computer to make sure one isn't surprised when the lights come on and the clocks all flip to 6:00 again.

It is now 30:00, and the lights are still on. A less funky Maria might find this a cause of concern; as it is, the only feeling she can muster about day-like lighting in her quarters is that it seems apt for the lukewarm drama of *My Heart's Revolution*. She's been up for 24 hours now, but she doesn't feel tired. Whatever the technologies in her bed do to her, they work like a charm: if the computer wants a long day out of her, it'll get one.

The plot of *My Heart's Revolution* has grown new tendrils. It's almost, Maria grudgingly admits, starting to get interesting, though it's the empty-calories kind of interest conjured by the kind of screenwriters who lean heavily on the perennial appeal of mystery and convulsion. The student leader is, it turns out, an undercover agent of the government; the government has its own internal conflicts; the advocates of liberal reform find a fierce enemy in the "student leader" himself, who is in fact a staunch reactionary; the reporter, delving further into the radical subculture, becomes more and more a true believer in the creed that her crush was only mouthing insincerely; everywhere there are hints of conspiracies yet unseen, mysterious links and collusions between characters who had seemed to belong to different parts of the story. It is keeping her attention, though most anything would, really.

In her closet is the locked chest containing the Summer Diary, which she had resolved to open the moment she got back from her scouting mission. She had told herself that that summer had been just as real as this purgatory, and that she had no reason to push it away as though it were unclean. But the moment she got back, her will failed her. And that was the start of the funk.

**36:00**

She has been awake for thirty hours, still as glazed-but-untired as ever, when the television speaks to her again.

The show is full of incident, and Maria has given up on keeping precise track of it all. Somewhere along the line the student leader was revealed to be an idealist after all, but an idealist of some strange stripe, his true (?) loyalties aligning with a wealthy, shadowy and powerful family to which the journalist was distantly related. This was, in fact, the reason he'd agreed to be interviewed. The latest episode begins in an opulent mansion, lit dimly, where the student leader converses with some prominent aunt who, in the crudest of cinematic symbolism, sits in in literal shadow, only her hands and legs visible. Their conversation drags on, dropping endless keywords as yet undefined for the viewer.

And then, there it is: that overlong pause, that turn to the camera, the would-be-comedic quick zoom. The student leader's mouth opens, and Maria's past speaks.

"Keep watching. There is more after this."

It's definitely Martin, but the voice is unusually insistent. He is normally calm under pressure, to the point of seeming occasionally callous, but now there is a thing like fear in his voice he can't suppress. It is a chilling effect.

"You aren't as safe as you think. There are dangerous heteropneums even here. They will come soon. You're strong, Maria, but not as strong as they are."

Another pause, the man's face inappropriately blank, as though he's reading an unfamiliar script off of a teleprompter. Which, for all Maria knows, may be close to the truth.

"There is a man named Horatio Tile here. He knows how to build a weapon which can defend us. You must contact him yourself. This Sphere is not a safe place. Don't trust anyone but Horatio. Bring him into your confidence. Don't do this for me. Do this only if you are comfortable joining me against those who would stop us from saving ourselves."

The student leader suddenly turns and speaks in a different voice, of invented intrigues rather than real ones.

**39:00**

The lights are still on, but something has changed. Maybe it's just the sleep deprivation, but the funk is either starting to lift, or starting to metastasize into some new form.

*The lie is the I*, says the litany. It's taken on a new meaning here, in this limbo state. What *is* Maria, anyway? Surely not a binge-watcher of bad TV. Surely something else. Someone with a duty, a grave and strange duty, the kind of thing one must travel to the bottom of the ocean to find. The only way out is further ahead, through the complexities of the plot. Maria's self is tangled up with the Sphere, with the sub, with Martin -- so be it. Open the box. Talk to Ratio. There is more here than a bad TV show. Maria feels like she's seen a faint glimmer of light in the darkness, and has begun to swim toward it.

She opens the closet. She had retrieved the key from its hiding place when she got back, and it's been in her pocket all floorday. She puts it in the lock and opens the chest. Inside are piles of paper, covered in handwriting on the edge of indecipherability, scribbled down from memory in a frenzy after she realized her memories of the summer that did not happen were fading. She picks up a page and begins to read.

## Hermes

Long day down here. Long day to look at all the little pieces of the fullness. Hermes Cept has been staggering about his little room for what? twelve hours now? Appropriate that the lights are on, yes. To see things, as the cliché goes, *in the light of day*.

The light of *floorday* he corrects himself with a sigh. This absurd tendency towards neologism among the flat creatures. Call a thing by its name, just once, and God would burn them up on the spot. (What is he thinking? This is crude, cruel, pathetic. Start over.)

Call up the facts again. All the little pieces. A piece: first contact has been made. There is no longer any hope for quarantining the flat creatures from the full creatures. Hermes has wondered if there was anything he could have done. But no: this was a possibility he had never prepared for. He'd tried, and tried, to stop the horrors from spreading on his little model of an earth, and here they are storming the gates of the one and only Heaven.

A piece: fragments of fullness poured out from a child's mouth. An innocent child, here to tell him of the innocent world -- yes, perfect (too perfect?). And here she is, poor thing, defiled by the flatness. In the belly of the beast. What crude questions will Tile prod her with? What ludicrous intrigues will she be drawn into, down here on this ship of fools?

A piece: he was here in his own fullness, and so was Mohammed. The child told him of "Herm" and "Selm" -- Hermes and Salim. Could that be? His name was not Hermes even here, was it? And he and Mohammed were -- brother and sister?

He keeps looking in the mirror, at his bald dome and bony mask. He can see nothing remotely female there. What does it mean, that his full self was a woman -- if indeed that was true? What *could* it mean? He imagines his thin old lips coated in lipstick, his wrinkles subdued by makeup. No: this isn't a real image. *Can't* be. Full is full and flat is flat. He is --

But who is he to argue with God? Who is he -- she? -- to argue with the fullness? "This isn't," "this can't be" -- isn't that the sort of thing the flat creatures are always saying?

A piece: there is strife in the full world. War stories apparently without end. Entire continents impassable. Aftermath of a nuclear war? A pneumatech war? God only knows. But strife is acceptable if it is real. Yes: full is full and flat is flat. Nature abhors a gradient, and some gradients do not go to the grave willingly. So it should be, and so it is.

A piece: the computer. It has made the day (*floorday*) long. What does it think it is doing?

Hermes feels dizzy suddenly. He sits down on the bed. Lies down. Looks at the ceiling. Lights still on. He feels impotent. He had secured all the power he could get, when he first arrived in this world, and now none of it is of any use. He thought if only he could guide the scientists -- stupid. Stupid. If only he could guide the scientists. But they aren't pulling the strings here. And who is? Who can say? The flat creatures and their games remain as inscrutable as ever. Useless, useless.

A sudden noise. Boltzman? No, it's the computer. Hermes debates getting up. Seems so pointless. No: need to keep going. Still here, still staggering. Onward. The comfort of the mission. Do what he must. (What she must? No: it doesn't -- *fit* ...)

The computer is telling him about something he could have already guessed:

**Ratio T.** [preprint] A Comprehensive Branch-Loop Analysis of the Reintegration Plume, and Implications for the Branch-Loop Theory Landscape (joint work with Cecelia R.)

Hermes clicks and yes, and it's what he expected, of course -- the flat creatures have figured out the obvious, overcome his resistance at last. Pandora's Box is open. There was nothing he could do. (No, no, don't rationalize. He has failed, unequivocally. He already knew that, of course. Nothing he can do *now*.)

Whatever will become of the child Selp, and the great sprawling full world, and his Mohammed? The flat creatures will trample over all.

No -- it can't be allowed. Keep going. The comfort of the mission. The mission goes on. Embrace the full things. Align with them. Fight to the last.

Hermes looks in the mirror, for the thirtieth time this floorday, sees again the decaying thing that is his face, and now he says to himself, with a sprinkle of divine madness in his voice:

*I am Herm, sister of Selm, who wept when my brother looked into the well, who saw the center of Iah. I will fight to the last. I will not let the world end.*

And for a moment all is right, and a tranquility, rarely found this deep in the abyss, falls over the bright hushed room.

## Cecelia

Cecelia's down here with Ratio in the cafeteria, shooting the shit, almost as though it's just any other floorday. It's *hour 45* of this particular floorday but Cecelia got accustomed to sleep-dep back in college and never quite got un-accustomed. So she feels on home turf. The burnt-toast smell is beginning to pervade her nostrils, which she'd usually thought of as an hour-60-and-past phenomenon, but it seems to be starting early this time.

The cafeteria has always provided a nice neutral space, an wide-open place -- too hard to find down here in the Sphere, and prized after a youth spent in midwestern prairie -- and a place where her bond to Ratio seems natural. They are friends, co-workers: they banter over meals. Who doesn't? They often stay in here long after anyone else leaves for one meal, and are here before anyone else arrives, which gets some stares. But it's a conspicuous display of social activity, and that makes Cecelia feel good: a bulwark against the ever-feared prospect of people imagining that she's some sort of misanthropic hermit, spiteful and spite-worthy in equal measure.

That worry, she tells herself, is not completely irrational. After all, her default expression is something like a peevish grimace -- she sees it every day in the mirror, and disapproves of it, which paradoxically *justifies* it -- and her appearance at work parties, to say nothing of scientific meetings, is sporadic. *They all think I'm judging them*, she thinks -- and are they wrong? But she's not some sort of fucking *elitist*. She doesn't think people are *beneath her*. She just has a highly limited and circumscribed capacity for *dealing with them*.

So anyway she's been on a cafeteria marathon with Ratio, waiting out the day. They've both got laptops out. Cecelia's been idly twiddling with some frivolous branch-loop simulations, a victor dancing a jaunty little jig now that her enemy has been routed and composure is no longer necessary. Ratio has put theory aside for the moment and is currently engaged in a heated intranet debate about the Starchild Universe, a sprawling, persistent sci-fi world he and a few other geeks down on the Sphere have devised and depicted in numerous works of (let's be serious: pretty dismal) fiction and a complexly inter-related array of (surprisingly well-done) computer games.

The Starchild Universe includes time travel, which complicates things immensely. Ratio was against the idea in the first place. But it stuck by majority vote -- 3 against 4 (the Starchild Universe appeals to a select elite) -- and now the consequences have wreaked havoc on the Universe's lovingly plotted history. Ratio types furiously, trying to broker some kind of compromise between the ever-disputing MeowEllipse and DogShatter (real names known but rarely used), all the while pointing out that if *he* had had his way none of this nonsense would have started in the first place.

Occasionally, they talk. Mostly, they just laptop. It's a good place to be.

And then all at once this steady state, which has continued for a number of hours Cecelia can't estimate to within error bars narrower than 6 on either side, is broken by the arrival of a spectral figure, moving with a slightly inhuman energy, seemingly not quite sure it likes its physical form and wondering if it can go back to the shop and exchange it for another one.

The specter sits at their table, facing them. It's Maria.

Having realized this, Cecelia re-calibrates her original impressions and realizes that Maria doesn't look quite as weird as she'd originally thought, upon her approach. Though she still looks *weird*. Odd gait, circles under the eyes (of course), eyes themselves open a little too wide for Cecelia's comfort. Hair looks unwashed, which everyone's does at this point, but there's even some visible electrode paste there, which is odd because surely *that* can't be chalked up to the floorday being so long. No doubt she would have washed it out this morning, 45 hours ago . . . ?

Anyway, they're all cracked out at this point. Cecelia happens to like being cracked out but she realizes this isn't everyone's preference. Lord knows she wouldn't want everyone to be just like her: after all, a world of Cecelias would be so damn particular about who they associated with that . . . well, best not to go there.

"Hello," Maria says.

"Hey," says Cecelia. "Don't see you that often." Ratio had glanced up from his laptop, but has since returned; the latest salvo won't write itself.

"I know. I've been . . . busy," Maria says limply. Cecelia knows the truth: Maria can't stand her or Ratio. Which is understandable: they are, at the very least, acquired tastes. So what exactly is she doing at this table?

"Look," Maria begins. "I know you guys understand how pneuma works. Really works. You can . . . build things."

"I suppose we can," Cecelia offers.

"I need you to build an engine."

"What?" says Cecelia.

A pause.

"What kind of engine?" says Ratio.

And Maria's eyes open even further, and Ratio's face is fully visible above the laptop, and there's a kind of charge to the table now: *now we're getting serious*.

"I've . . ." Maria seems to be wrestling with how to phrase something with appropriate delicacy. "I've been talking to a man. A man who knows a lot of things. He knows about your theories, and how they'll make the loops crystalize because the ascendance ratio is just right."

It is now Cecelia's turn to open her eyes wide, because this is something Maria could not *possibly* know. She is describing a feature of the latest R&C theory, one they hadn't even released in the pre-print, because it was too tentative -- not sufficiently well-supported by reinteg\_plume.mat -- and they felt they could be plenty convincing if they stuck only to what was inarguable.

She turns to Ratio. He shrugs. So Maria knows: more grist for the shop-talk mill. In Ratio's world this is an unalloyed good. Cecelia smiles.

"I know you can make an engine that will generate power the way the heteropneums do it. Giant fields. I need to you to do that."

"Why?" Cecelia asks.

"Because," and Maria lowers her voice and leans in, a bit over-dramatically, like a child whispering secrets on the playground or an actor over-emphasizing a stage whisper, "there are still heteropneums left. They came with us in the plume. And they are worse than anything we've seen before. Either you build that engine, *soon*, or we're dead. Dead *at best*."

Even Ratio is taken aback by this. But he quickly regains composure and initiates a flurry of shop talk:

"She's talking about how the loops will crystalize because  $\lambda_5$  is fine-tuned --"

-- so under ideal conditions we don't even need a special pre-prepared state or a startup energy source as long as we can get spontaneous crystallization --"

-- the reaction just *fuels itself* the moment we get it --"

-- and so we're talking what here? Like an ordinary eigensoul decomposition's not going to do the trick because of the negative weightings --"

-- but just do a Salim-Frobenius decomposition and --"

--*bam*."

"We could do that with a few pneumases! Not even weapons-grade! Just a research kit would be sufficient, *more* than sufficient --"

Cecelia realizes something about this oh-so-ingenuous plan. She turns to Maria, who hunches, ghostly and expectant, at the other end of the table.

"Maria, this kind of . . . *engine* you're talking about. We could build it. It wouldn't even be hard. But it -- well . . ."

Ratio fills in for her. "It would involve splitting and recombining a human pneuma. We'd need a volunteer. No guarantee it's safe. Wouldn't be ethical."

"I'll do it," Maria says.

She is intense, self-possessed despite her unkempt appearance. There's almost something *compelling* about her, the tempting confidence of mania. Despite herself, some part of Cecelia wants to buy whatever she's selling.

"We can't guarantee your safety. I think we should all sleep on it." She laughs, but no one else does.

"We can't guarantee *anyone's* safety. We *are going to be eaten alive*. The clock is ticking." Maria's unwashed hair splays in a halo around her. She makes a very transfixing prophet of doom.

Cecelia looks at Ratio, and in his eyes she sees what she knew she was going to see there, and knows: *we're going to do it*.

In the Sphere all bets are off, and all one can do is keep running, on and on, bounding from one mad idea to the next, and counting on one's personal brand of madness to stay alive. And so they are going to go on, further, ever further, into ever stranger uncharted waters.

## James

James does his duty, always. He is a useful man, and he takes pride in it.

Sometimes James' duty is a little unusual, but he does it anyway, because that is the kind of man he is. This is that sort of time.

The elevator doors open and James steps forward into the narrow corridor. All of a sudden he is very hot. He keeps walking. And now a wind whips about his clothing and ruffles his hair. Keeps walking. Opens the door.

The room that opens before him is even less well-lit than usual. All the lights are off except the displays on the wall, which pulse in candy pinks and blues, reporting a Sphere's worth of data. As his eyes adjust to the darkness, he sees the bookshelves, and the chair, and the man.

"James. It's good to see you."

"Thank you, sir."

Martin sighs. He has never managed to get James to treat him as a friend and not as an officer. In an odd way, for James, it is a way of remaining some slight power down here -- insisting that the order of things to which he feels he belongs applies even down here, in the bottom half, where everything is inverted.

"James, I've called you here for a simple reason. But let's be civilized and chat a little before we get down to business, shall we?"

"Whatever you wish, sir."

Martin laughs, and it's his usual guileless laugh, as though James had told a joke, a lowbrow and truly funny joke.

"I hope the erratic schedule isn't bothering you. I wish these kind of things weren't necessary. No one likes getting their sleep schedule messed with. We may be sparks of transcendent soul but we've still got a mammalian nervous system with a good old circadian rhythm built in."

"I've been fine, sir. To be honest, I've dealt with a lot worse."

"Of course you have." James' pupils have adapted enough that he can now see the smile on Martin's face matching the smile in his voice.

"So how have you been, James?"

"Well, sir."

"And how's the little girl you brought down here?"

"She's producing food at a rate sufficient to provide basic nutrition for the Sphere."

"James. *James*. I *know* that." Martin gestures to some subsection of his innumerable displays. "I mean, how is she feeling? Far from her people, under the sea. Essentially our slave. It can't be easy."

"She seems . . . happy enough," James says tentatively. "I've talked to her a few times, and she just babbles about how she feels happy to have a purpose, and how she's sure it's what her God . . . her 'Yah'? . . . would want for her. She's also not completely isolated. She seems to have made friends with Hermes Cept."

Martin laughs his laugh again, but louder this time. "Now there's something I didn't think was possible."

"They're both on the margins of social life, I guess you could say."

They talk for a few more minutes. It is stilted. James is always guarded around Martin. He does his duty, but that does not include letting on more than he needs to. He doesn't trust Martin -- and really, who *would*?

"So here's the thing, James," Martin finally says. "I need you to turn LUDWIG's sensor array back on."

"Excuse me, sir?"

"The sensor array. Turn it back on."

James is taken aback. "But sir, didn't you tell me those heteropneums in the chasm were the same ones he'd been talking to? He's just going to start talking to them again, you know."

"I know, James. But it needs to be done. I can't explain it now, but things are going to become very different for us, very quickly. New challenges await. We can't be blind. We need LUDWIG at his full capacity."

"I understand, sir. I'll make it happen."

"Thank you," Martin says, as he always does, as though it's a personal favor, done of James' own free will.

## Miranda

Floordusk has come at a reasonable hour, this time. It has been four floordays since the Long One -- as they've started calling it -- and none of those subsequent floordays have been anywhere near as distorted. But they've still been *off*. One floorday only lasted six hours. One floornight was eighteen, and they all slept it through like babies, until the computer woke them up.

Miranda is slumped on her big couch, inattentively watching pseudo-medieval soldiers duke it out on TV. She's seen this episode before, but the TV stores that came down in the final shipment have run out. They ended on a cliffhanger, and now no one will ever find out what was going to happen. No great loss, for Miranda anyway: she'd never particularly liked this show, and watched it mostly for solidarity with her crew, among whom it was quite popular.

Miranda has tried to do other things for recreation, but she simply can't focus on, say, a book: her thoughts immediately drift. Better to leave the TV on, looping through this turgid fantasy again and again, this thing which goes ever on whether she is paying attention or not. Occasionally something new catches her eye -- some glint in an actor's eye, some ingenuity of set design only visible in one shot -- and that'll send her into a brief, blissful reverie before her mind returns to baseline.

Miranda really does not know what she is for, anymore. There are no heteropneums here to name. She's managed to get her office in order -- it's amazing how efficiently one can work when there is no *actual, important work* that needs doing -- and she has actually run out of paperwork to distract herself with. Martin seems to know what he's doing, but god only knows what *that* is. And she keeps coming back to his last words: "Enjoy Maria while you can." What could that have meant? "While you can" implies an end, but what is to change? Down here nothing changes anymore, except for the lengths of the days and nights. Not to mention that the predatory connotations of "enjoy" rankle.

Had she been *enjoying* Maria? Christ no. She had seen Maria in the cafeteria the floorday after the Long One -- had seen her eating alone in the cafeteria, and had chosen to eat with her -- and the interaction was many things, but *enjoyable* was not one of them. Asked how she had been feeling, what she had been doing, Maria was vague and evasive. There was some light in her eyes, something new, that Miranda didn't like, although she couldn't put her finger on why.

Maria had *changed*. There was a frayed, furious urgency to her, but she refused to explain it. She was hiding something from Miranda, and Miranda had no place or person to turn to in order to help her understand.

Miranda wished from time to time that she at least had a therapist to work these things out with, but EPRN rules had dictated that there would be no psychiatric professionals on the Sphere. Medication, if needed in the course of duty, was doled out at her, Miranda's, wise if untrained discretion (which is how she picked up her Xanax and Valium habit). Something about psychiatric intervention having "unpredictable effects on the human pneuma that cannot be subjected to EPRN oversight." Which makes a kind of sense, Miranda thinks -- and is also deeply disturbing.

Miranda is thinking over whether to pour herself a drink -- as if *that'll* help, really now -- when the doorbell rings. Now there is something new: Miranda's quarters are not a popular place at floornight. Who could it be?

It's Hermes Cept. He greets her, his voice wavering in an uncharacteristic way. He apologizes for "disturbing her" at this hour. Miranda laughs.

"It's not like we can avoid being disturbed, what with these insane floordays we've been having."

Cept nods curtly. He pauses in the doorway for a few beats, and then says, pronouncing the words slowly and deliberately as if in a foreign tongue:

"Can I come in? There is something I want to talk to you about?"

"Be my guest." Miranda gestures to her couch, and Hermes stumbles over to it and sits.

"Miranda, I . . ." he begins. Several beats.

"Yes, Hermes?"

"Can you . . . can you call me 'Herm' from now on?"

Miranda can't help smirking slightly at this bizarre request. Of all the things Hermes Cept, godfather of pneumatech, might want to talk with her about -- he's somehow decided he has something against the syllable "-es" now? What is going on here?

"Sure," she says, having forcibly restrained her smirk. "Whatever you wish, Herm."

Hermes -- *Herm* -- looks pleased, which is a rare sight. He begins to speak quickly now, as though "Herm" were some password that had unlocked his thoughts.

"It is my -- my *belief* -- that we are not meant to be in this place. It is a grave error, a sin, that we were brought here." He looks closely at her. "You feel it too? That everything has been *wrong* since the reintegration?"

Miranda can't deny it. "Something's different, yes. And 'wrong' would be as good a way of putting it as any." She thinks of her clean office, Maria's evasions.

"I think that our presence here will cause terrible things. Greater and greater sins. This world is a good place; it does not deserve our foul touch."

Miranda can think of no response to this bit of Cept-speak.

"The child told me -- Miranda, she *told me*, I *know* now -- that in this world I was a woman, a woman named Herm. And Mohammed -- he was my brother, and he was named Selm. Herm and Selm."

Something clicks now. Hermes sees this new world as good and the Sphere as bad, that much is clear. And so news of this world is news of a good thing, a thing he thinks the Sphere will defile. He is making at least a kind of sense.

"I almost thought of giving up. But I want to fight the sin. Fight it to the last. Will you be my ally in that fight, Miranda?"

Miranda has said "yes," out of social instinct, before she can begin to think about what this strange pact might entail.

Cept smiles. "Miranda, there is one thing you can do to help me, right now. Because if this world is the right world, then I

am not Hermes Cept, a man, but Herm, a woman. I am a partisan of this world, and as a partisan, I must don the garb of my true self."

"Don the garb . . . ?" Miranda is unclear what this is a metaphor for.

It's not a metaphor. Herm wants to borrow some of her clothes, some of her cosmetics. He -- no, she -- wants to be a woman, because she feels that her being a woman is the truth, the truth that opposes the great wrongness that both of them feel in their bones.

Living in the Sphere, one gets used to surprises, and Miranda finds herself quickly assimilating this one. Yes, she's definitely never thought of Hermes Cept as *feminine* -- in fact he's always seemed a masculine archetype, the curmudgeonly scientific elder, making deep pronouncements in deep tones -- but the sense of change that he (she!) is bringing to the table is invigorating. When faced with something that feels wrong in your bones, make changes. Do things. Yes -- this feels right.

And what do you know, some of Miranda's clothes fit Herm just right. They're about the same height -- Herm was no doubt taller in her prime, but having shortened with age, she's now just Miranda's height -- and Miranda's figure is more linear than curvy, which is no doubt part of why Herm came to her.

And, as they pull out skirts one by one from Miranda's closet, as Miranda waits while Herm tries each on in the bathroom -- there is a kind of wondrous intimacy to this. Not a sexual or romantic intimacy, not a parental one. But the intimacy of two allies in a very wrong world, pushing back in one concrete way against the wrongness. The world is a vale of falsehoods, and here they strike at one of them together, delicately putting into place the negation sign, the  $\sim$ , which transforms a falsehood into a truth.

Then the alarm goes off.



## Maria

At floordusk, Maria waits, Summer Diary in lap, butterflies in stomach.

All of the last few years have fallen away from her the way a bad dream falls upon waking -- falls all at once, as if tumbling off a cliff. There was a time when she was just Maria N., quiet but well-liked student, surprise valedictorian. And then a time when she was just Maria, a carefree young woman spending her last summer before college with her aunt in a rural dreamland. At one of her aunt's parties her eyes had met those of another guest, a young scientist working in the nearby National Lab. And she was Maria, and he was Martin, and they walked on the firm beautiful earth, above ground.

There were real sunrises, and real sunsets, and every day was twenty-four hours long, and this rhythm was the base which their own faster rhythms had joined in concert -- their word games, their limb games. Martin could talk about books the way no one else could talk about books -- not like the pretentious hand-raisers of her English classes, always searching for the brittle hidden meaning, but with a sense that language itself contained endless delights that were the also delights of the soil and the sunset. Anything could be combined with anything else, and this was the engine of humor just as it was the engine of beauty, and thus she and Martin could make jokes that depended upon other jokes that depended upon the curve of an arm, the odd barren look of a dead tree. If their jokes had been chess moves, each would have rated a (!).

Of course, this has never happened. She had never been that Maria. And when the cracks began to appear -- when her aunt, again and again, professed never to have witnessed this or that, and began to wonder aloud if Maria was not altogether right in the head -- that was when it all started. The people her aunt knew at the National Lab found her new species of madness quite interesting, quite relevant to their own research, and even claimed to have an experimental *treatment* for it, and the rest was --

-- history? No. The scales have fallen from her eyes. What was lost can be regained. Who would believe this story, of people living on the ocean floor, of mousy but studious Maria N. becoming a *submarine pilot* (of all things!), of mad science, sci-fi monsters, a secret paramilitary? *This* isn't the real story. *That* one was.

She knows the heteropneums are coming soon, because Martin had told her. She has told Ratio and Cecelia to build the engine. She wonders whether she was wrong to involve Cecelia -- Martin had only mentioned Ratio, told her to trust no one else -- but the two were inseparable, and he would have to be satisfied with the best she could do. He *would* be satisfied, she knew. He had always been.

And so when the alarm goes off, shrill and insistent, she does not feel afraid or resigned. This time is different. She has fought hundreds of heteropneums, but this time Martin is with her -- not in memory but, somehow, somewhere, in flesh. She is going to return home.

Some part of her recognizes that the alarm is abnormal. In an ordinary attack situation, Miranda would be informed and would call her before everyone else was alerted. Many heteropneums could be easily dispatched, and there was no use warning everyone unless they posed a real threat. But here it is, the synth voice that talks when hiding the danger is no longer prudent:

*Abnormal storm of Boltzmen detected near outer shell, amplitude 10.2 kCept. Boltzmen are non-human. All personnel are advised to presume that a heteropneum attack is imminent and proceed to shelter locations.*

The sensors must be back online now. That's funny. But then of course they would have to be: how else would they know the heteropneums were coming?

10.2 kCept is a lot. But she does not fear, because she knows she is going home.

She leaves her quarters and begins the run that is fixed in her muscle memory. The lights are dim, simulating the last moments of dusk. She can see in the half-light people running around her, rushing to shelters padded with heavy pneuma shielding. She bumps into a few people, on autopilot, making nothing of it.

She has reached the dock and seen her sub before it occurs to her: what about that new engine? She hasn't heard back from R&C. It's not like they would have installed it in the sub without telling her. Something about this is wrong.

There is a hand on her shoulder, and she turns.

Behold the man: eyes that *know* her, the way they *knew* her that first moment at her aunt's table. Short blonde hair she remembers ruffling. The suit, an affectation she knows, worn on more occasions than strictly call for it. The hand, the *physical* hand -- solid, like the earth, not some trick of slippery soul magic but solid *flesh* -- on her shoulder. Long fingers she remembers, joints and knuckles she has touched.

"It's good to see you, Maria," Martin says.

"Good to see you too, Barrister For The Frogs," she says, invoking an old in joke, feeling like she has just spoken an incantation for some powerful magic spell.

Martin smiles, a bit stiffly, and says nothing. Maria was expecting him to top it with some clever rejoinder. But it's been a long time. There will be time to reconnect.

"You can't fight these things with the sub. You're going to need that engine."

"I understand," says Maria. "I'm ready." She is ready.

"It's in Free Pneumase Usage Room 1," he says, because for some reason he knows. "Come with me."

He extends his hand, palm up, revealing lines she remembers tracing. She takes it. And they run through the dusk, as they'd run once through the dusk back on solid ground, chasing the sun. She is home.

## Return

Free Pneumase Usage Room 1 is not blank white, like the others. Its walls and ceilings are matte black, lighting courtesy of klieg lights on poles in a regular array along each wall. It's also *huge*: the size of a football field, dotted with machines and lab benches. At one end is a raised platform, lit brightly from above, looking for all the world like a theatrical stage.

This platform is shielded off from the rest of the room by an invisible, but very strong, pneumatech barrier. The platform is where you test things that you think might explode, or spawn monsters, to name two of many possibilities. Things like Ratio and Cecelia's engine, which sits alone in the center of the stage like a piano, indeed the approximate size and shape of a grand piano, a nondescript heap of lab parts jerry-rigged together. The platform's lights illuminate it mercilessly, as though it were some *objet d'art* in a museum.

Ratio had been running for shelter when he'd heard the peculiar synth announcement:

*All personnel Rank A and above, report to Free Pneumase Usage Room 1. This is an order.*

He'd card-swiped his way through the door to find Cecelia already there, near him. They are near the platform, at its right side, from the "audience's" point of view. They exchange glances.

A ways across the room, closer to the platform's left side, are Miranda and Hermes Cept, standing together, Hermes wearing . . . *one of Miranda's skirts?!*

Well there's a little bit of private life Ratio didn't feel he needed to know. But to each their own. Lord knows everyone in the Sphere needs some sort of outlet for their id.

There are others here. James, LUDWIG's operator, who Ratio doesn't know well at all. Janelle, the Sphere's reserve pilot, who he's never spoken to. Some of the senior scientists and administrators. The door opens in and Ratio steps aside to let a few more people trickle in.

There is an awkward moment. No one wants to approach each other. No one knows what they're there for.

The door opens a last time, and in rushes Maria, hand in hand with someone Ratio's never seen, a luminous man with short blonde hair and a gleam in his eye. Ratio immediately feels a little jealous. Just where has Maria been hiding this treasure of a man?

Maria and the stranger run right toward the platform, through the barrier, and take up position by the machine. The man is wearing a suit with a carnation on his breast; he looks less businesslike than princely, an operatic hero on stage with his forbidden lover.

"Welcome, everyone!" he says, and though his voice is not amplified, it is easy for everyone to hear, close as they are to the platform. "Some of you know me. For those who don't, my name is Martin. And I think the love of my life" -- he gestures toward Maria -- "needs no introduction."

Maria looks at once lost and, in some deep way, found. Ratio glances over at Miranda and Hermes, who are both responding with complex emotive gestures that are, at least at this range, incomprehensible.

The room shakes violently.

•

Herm knows this man, and is wary of him. This man, who was always in the background whenever EPRN business was transpiring. This man, who said little, and seemed to know much.

Herm does not know why he has called them here now, to watch this cheesy little performance, while monsters pound at the doors. There is something about him that -- yes, *that's it* --

This man is the flattest of the flat creatures.

And this is the height of flatness: pure artifice, flamboyant and cheap display of emotion, while all that is serious, dangerous, real, cries out to be heard.

And yet he is biding them time. If the heteropneums manage to destroy the Sphere, the aberration will have been removed, and the flatness will be gone.

Strange.

The man is speaking again. Herm turns away from her thoughts to listen:

" . . . I am here today to show you that there is more we, the human race, can do than you have ever dreamed. Maria and I knew each other, years ago, in a branch lost to the merciless logic of the world-tree, and yet here we are again, together! We no longer need to fear. We no longer need to -- "

-- the room shakes again --

"-- cower before anything. The future is bright, and our dreams will be made real, by the magic of the light in our souls!"

Maria's face is half-turned toward him, half-turned toward the audience, something like awe playing across it.

What is this nonsense? "The magic of the light in our souls?" *The world is wrong*. No one speaks like this outside of children's stories. What on earth is this man talking about? What do his sappy words really mean? What is the salvation he promises?

The room pitches, and Maria nearly falls over, but Martin catches her, and she relaxes in his arms.

•

Miranda thinks she sees Maria, in Martin's arms, turn to look at her. She thinks she sees a flicker of something like sadness there. But it doesn't matter. Really, really, it's never mattered.

Martin has always been there, before everything. He offers this -- whatever on earth it is he is offering -- and she's only, in the end, an ordinary woman.

When Miranda signed on to work in the Sphere, she agreed to cope with logics beyond the merely human. So be it.

"Our dreams *will* be made real!" Martin says again, "and I will show you how!"  
Our dreams? *All* of our dreams?

•

"I'm going to turn this machine on now, Maria," Martin says. "You'll be safe. Are you ready?"

"I'm ready," she says, in a loud, clear voice. A slightly fanatical voice. The flat creatures communicate in broad gestures.

Martin does something to the device, and the results are immediate: Maria begins to *glow*. Her outline is traced by a purplish-white light. It is somehow *too* purple: the visual equivalent of a broad gesture. Maria's eyes grow wide. Martin still holds her, and the aura does not seem to affect him.

The glow expands, and now it is pulsating, cycling through colors, a full rainbow radiating from Maria and extending a full six inches around her on every side. Colors everywhere appear to intensify, grow too vivid: the world has turned technicolor.

A scrambled gibbering scrapes its way across Herm's mind. Boltzmen. They must be *incredibly* powerful Boltzmen to manage to get across the shield at all. Herm looks around: everyone else is feeling them too.

And on stage the technicolor drama continues. We have left all real things behind and are now in Oz. Martin, prince of flatness, cradles his radiant princess, and she looks up at him with the devoted expression of every mid-twentieth-century starlet of the silver screen, and she looks like she's about to speak --

-- and of course, yes, here it comes, the line without which no schmaltzy romance would ever be complete --

Maria opens her mouth, and says, loudly, clearly, radiantly:

"I [,,,,] you."

•

Ratio knows, in theory, how the engine is supposed to work. A soul splits, untagged, and its pieces commingle with the pieces of all souls in the causal vicinity.

He does not know what it is supposed to look like in practice. The aura took him by surprise. He does not know what to make of the word Maria has said, which struck his mind like a Boltzman, filling him with emotions for which he has no words.

Everything is very bright, and very vivid, and Maria is -- walking *forward* -- walking *through* the barrier -- the aura pulses -- and now she is speaking again, louder than he had ever thought she could speak, yet somehow calm, welcoming --

"i [teem]."

James rushes forward, inexplicably, a look of urgency and terror on his face. He looks like he's about to tackle Maria. But she extends a radiant arm to touch his shoulder, and immediately he stops.

"let us be [friends]," she says. And James stops, very still, and then he too begins to glow, and everything becomes very confused all at once.

People are rushing about, or not rushing, standing still, fractal ridges of rainbow aura are cutting their way across everything, and then suddenly everyone turns, in eerie unison, to Martin, who has begun to speak again.

"This is the energy source of the heteropneums. This is what will carry us into the bright future." He looks above him. "LUDWIG, are you capturing this?"

A voice Ratio has never heard before. "Power output is steady and oh so tasty, a food that stands in relation to all prior foods as the continuum stands to the countable! My inner gourmand [teems] with zealous delight!"

"Can we begin now?" Martin asks the ceiling.

"But Martin, you asker of miracles, the sprint you want requires such reserves of ATP that we will still need our reserves of coherence power, which -- "

Martin cuts him off.

"Then do it, LUDWIG! Play the symphony!"

•

*Yes, we get it*, thinks Herm. Very clever. Ludwig like Boltzmann but also like Beethoven. What a hammy actor. And yet, as she thinks this, there is something, something purple, of unspeakable depth, at the edge of her perception, and it speaks to her as if in counter-argument . . .

•

All over the Sphere, in the various shelters, people begin to feel their skin tingle. It is an intensification of something they'd felt earlier in the week. Most of them had chalked it up to sleep deprivation. But now here it is, unignorable, that odd feeling they'd had all week coming up behind them and speaking so that they cannot avoid hearing.

•

Floating in his null sensorium, mind tingling with possibility, LUDWIG notes a spike in power collection. A great deal of coherent pneuma light has appeared in the shelters. He feels with pleasure an instinct, built into his software and never before triggered.

Yes, it is right to begin now.

•

Around the place where the Sphere's equator meets the ocean floor, a sudden roil of turbulence. Pneuma energy is being transformed into heat, and the suddenly warm water around the Sphere's base rushes convectively towards the surface.

Slowly, the Sphere begins to rise.

In the pneuma spectrum, things are much more exciting. The Sphere is surrounded with a intense aura of energy, throwing off Boltzmen furiously. In the chasm, the [Teeming] watch the Pneuma Lightshow with pleasure, taking [joy] in the [Unfolding]. They make [friends] with passing Boltzmen. All is well.

The Sphere has broken away from the ocean floor, and now it rises faster and faster, forming a larger and larger bubble of hot water vapor around it. Pneuma energy looking for a home in the whirl of worlds finds its resting place in the simple abode

of physics, and the bubble gains kinetic energy. The surrounding waters rush outward faster than any earthly wave, creating a giant depression in the ocean surface, circumscribed by a raging vortex hundreds of kilometers wide.

From out of the center of this great eddy, the Sphere emerges. It floats higher and higher into the air, now glowing with the light of pneuma energy that has found its way into the Maxwell spectrum. In every direction, Boltzmen shriek across the night, bearing the good news.

•

In Free Pneumase Usage Room 1, the walls appear to shift. No one is sure what is going on.

Captured by curiosity, Ratio rushes to look at one of the aberrations. He finds himself looking down, from a great and growing height, at an ocean in frenzied cyclical motion, lit up vividly against a night sky.

Like many rooms in the Sphere, Free Pneumase Usage Room 1 has windows. And now one can *see the outside*.

Ratio turns from the window. Martin stands on the stage, and Maria and James are now beside him. Everyone else is standing still, as if in prayer. Everything is lit up Christmas-like with day-glo light of every color in the visible spectrum, and some besides. The room is charged, somehow, with hopeful energy.

And inside Ratio's head, he hears:

*When the moon is in the Seventh House*

*And Jupiter aligns with Mars*

*Then peace will guide the planets*

*And love will steer the stars*

*This is the dawning of the Age of Aquarius . . .*

•

*War Conditions Journal, 18/41/3982*

*Bless this night! Bless Iah, our roiling yawning father!*

*The Merkabah mystics have had enemies, which is right, for interpreting Iah's word is not a thing to be done lightly. But tonight, as we looked at the moon from the cape, watching for signs, a great wind struck us, and for a moment our minds were all lost, and we felt not our own thoughts but only divine chaos. And when the moment was over, there was not one moon but two.*

*The Merkabah has returned! Iah has come to us at last! May we be worthy!*

**END OF PART 2**

## [this-one-who-does-not-individuate]

### PART 3

She remembers being here, sitting on this beach, with him, shortly after dusk. Sitting right on the ground, the sand a bit uncomfortable, some sort of cocktail in her hand, now about half full. The water laps in and out, lazily. They're in a sort of cove, and to their left and right are mountains, in this light just blots against the very dim glow of the sky. Above, countless stars, shot through with the dim band of the Milky Way. As a city kid, Maria isn't used to this flamboyant celestial display, and she can't shake the sense that it isn't real, that this simply *isn't what the stars look like*.

It's sometime in August, she thinks. Yes, sometime in August . . .

She turns to her left and sees him, discernible as a little bright tower against the pure dark of the mountain curling behind him. She can make out the breeze, warm but slightly bracing, playing with his hair.

"This isn't quite how it happened," she says. She isn't sure if it's a statement or a question.

She tries to remember. It's sometime in August, and they'd gone out to the beach . . .

"Because I dropped my drink and it spilled on the ground. I hadn't even had half of it yet. And you laughed and told me I should watch myself when I get to college."

But now she has her drink securely in hand. And she sits back, relaxes a bit, takes a long sip, and gazes at the starscape and the tranquil ocean.

This is all so *relaxing*, and yet that word is so wrong -- because part and parcel of the relaxation is a profound *excitement*, a stirring, a curious internal movement. A sensation of devious glee, of having beat the system.

How can it be, that one can *really* do this -- that one can *really* end up sitting on beach with the stars sprawling above, the sea just a calm friend, a stiff drink in hand, Martin to one's left . . . this, *this* is not permitted. What one *does* is keep grinding on, gritting one's teeth, fighting battle after battle, and keeping that little piece of glee secreted in one's heart as a reason to push on. One can *envision* this, but one can no more *live* in it than one can step into a painting. And yet, here she is, sometime in August, in the summer, on the Northern Hemisphere of this revolving earth . . .

She thinks, for some reason, of her grandfather, sailing in the Navy in World War II. She sees him on shore leave, finally, after months of toil, dead drunk on rum, looking up with dizzy eyes at a sight like this sky. Maybe that was his way of stepping through the painting. You can't really be there, on the other side of the painting -- except perhaps on certain special evenings of occult significance, blessed by a subtle force which tells no one but you its devious secret -- on certain summer nights, in August, you can look up at the stars with drinks in your belly and a woman you've just met at your side, a woman you don't know, but who might one day (the alcohol makes her grandfather romantic) become your wife, the mother of your children, grandmother to little Maria -- well, anything really is possible on these few special nights, these tiny things God forgot when He tallied up the balance sheet of life and made sure it all added up to zero.

Maria thinks of the crystalline quality of certain pop songs, of the unrepentant jubilation of a synthesized melodic line, pointing toward the other side, which is too much: too many stars, too much glee, a positive quantity in place of zero.

*I will find my satisfaction on the other side, where there is no "I."*

She takes another sip, and says:

"You know, I never drank on the Sphere. Not a drop. Even though they built special breweries down there, just so people could have their fix."

"Because it would remind you of me." Of course he knows.

And now that he has spoken, something has changed. It didn't happen this way the first time *at all*. She hadn't known what the Sphere was. And she hadn't felt that his words were -- *hers* -- that what she knew *he knew* --

-- and that what *he knew* --

"You don't remember this." She knows. They know.

"I do now. Because you do."

"But you -- you didn't spend the summer with me."

She would expect to feel outraged, betrayed. But she doesn't, not quite. Because she knows why she did it. Why he did it? Why . . . what exactly is the *word* one uses in this situation . . .

"Maria would have loathed you for doing what you did," says Maria.

"I know, and I'm sorry," says Martin, but it's her apologizing to herself, isn't it?

"I don't need an apology from myself. I'll never *betray* myself," says Maria.

"Life really is tough, isn't it?" Martin says, sincerely, with no note of mockery. "You can get as close to a person as Maria was to Martin, and that person can *still* betray you --"

"-- but I know *now* that I won't betray you now, and you won't betray me --"

"-- because we [teem] --"

"-- because in the next moment I might *be* you and you might *be* me --"

"-- and why would one ever betray *one's own* interests --"

"-- we're closer now, we're so close we complete one another's --"

"-- existences."

There is a pause. The heavens blaze, self-sufficient and impassive. Another sip. The alcohol is dulling the rough feeling of the sand beneath her, and making her braver.

"I see why you did it," she says.

"It wasn't planned," Martin says. "But when we found that our best candidate in the pneuma-branch study had had an affair

with me in an unreal branch --"

"-- what a *wonderful* find, yes --"

"-- it meant that there was something, a feeling, that could grow and grow --"

"-- absence making the heart grow fonder --"

"-- making her an even better fighter than she would have been with her innate abilities --"

"-- and reaching a kind of fever pitch when, finally, the beloved returns --"

"-- a state of passion conducive to the production of untold energies --"

"*Weaponize the self*," they mutter in unison.

"I'm angry at us for doing this," says Martin.

"But we had to," says Maria.

"Because think of all the suffering, suffering beyond all conception. Imagine every one of those stars up there being a soul in pain, and us doing nothing," says Martin.

"A mere doomed romance is nothing, compared to all that. It happens to virtually everyone at some point! It's the human condition!" says Maria.

"But there are worse things, and now you remember them," says Martin.

"We remember the New City and the torture chambers," says Maria.

"And think of all those stars up there, fusion reactions all -- what if every one is putting out its own Boltzmen? Think of all the Boltzmen who are born crying out in pain --"

"-- but only for, what it is it, a picosecond on average --"

"-- but a picosecond of ten hells worth of agony --"

"-- or ten heavens worth of ecstasy."

Martin laughs. "You know, EPRN put so much work into proving that it was ethical to create Boltzmen. That if such-and-such number of billion agony states are created in conjunction with such-and-such number of billion ecstasy states, it all sums up to such-and-such other number. You wouldn't have believed the *arguments* they had, the 'results' they derived, endlessly, pointlessly."

"There was a whole internal publication," Maria remembers --

"-- which, optimistically, they titled *Progress in Boltzman Ethics*."

"So you want," Maria says, already knowing what she wants -- and isn't it strange to think of what they are doing here as "speaking"? -- "you want to save even the Boltzmen? Every last one?"

"If we can."

"And your solution is this -- this state of closeness?"

"That," Martin says, "and superior firepower."

They look out on the waves lapping gently against the shore, mere harmless surf, the shallow stuff of dishwater, without any hint of malign and hidden depths.

## Amanda

Above, a single unadorned lightbulb. Around, a hexagonal stone chamber with a circular wooden table in the center. On one of six walls, a rectangular, hard-edged doorframe housing a black, shiny metal portcullis, behind which is pure black.

Amanda is here in the Babblibrary, her prison, her lifework. She is waiting, as usual. She has been here for hundreds of years.

Of course things have changed over the years. She used to prefer illusionary replacements for the bare physical space -- sweeping vistas looking over landscapes strewn with millions of books, or interlocking architectural marvels that glittered in whatever color scheme she liked most at the time, conjured with radix wizardry. She has grown more and more tired of these deceptions, as centuries of failure have made her more and more obsessed with her task. Now, she prefers to live as ascetically as a Salimist.

Going further back, she can remember the early days, when she was larger: a time when she was *Miranda*, Magna Mater Miranda, author of the Social Contract and spinner of new souls, the mother goddess always remembered and rarely spoken of, who watched over the New City from beneath, half-asleep and benevolent. Those were more optimistic days, days when she had imagined that the New City itself could be used as a kind of idea factory, a tool for chipping away at the Big Questions. But the longer she waited, the less she felt able to extract the diligence she needed out of her citizens, and so she took more and more of it upon herself.

Thus, the Babblibrary -- named, of course, for the hypothetical honeycomb in Osberg's celebrated fable. The name was all the more apt, she had thought -- bearing no illusions about what her new project would entail -- in light of Osberg's famous remark: *I have always imagined that hell will be a kind of library.*

And so she dwindled, bit by bit, casting off more parts of herself to swell the ranks of her loyal Babb librarians, until "Miranda" was no longer fitting and she had to choose a new name. Now she is nearly pre-augment, just a tiny woman behind a vast curtain. The tasks of the mother goddess can be done by silicon; what pneuma alone can do, Amanda and her Babb librarian army toil away at, decade by decade.

On the table, beside the typewriter and her glass of water, is a book: a real book, from the surface, written in the old manner by a New Citizen, not some phantasm dredged up from the blank depths of infinity. The author is one Estragon B., a power plant operator who, like so many New Citizens, dabbles in every realm of human thought and produces endless reams of text to be passed about and gobbled up like snacks by the general populace.

Perhaps it is just her feeble little mind, but the book appears to be useless blather: a very long-winded and self-important statement of certain esoteric results which Amanda and the Babb library had discovered long ago. Maybe it is one of those infuriating texts which only reveals its value once you have set just the right radix -- a kind of test of readerly devotion, a demand for the kind of time no one has (she thinks, expecting to spend years, decades, centuries in this room scanning idly over books like this). But there is a simpler explanation.

This Estragon appears to be one of the New Citizens who prides himself on the "authenticity" of his inspiration. The New Citizens have been arguing over this point for ages; it is one reason among many that Amanda finds them less and less useful as an engine of thought. The Babb library was built on the principle celebrated by Estragon's theoretical enemies: namely, that the ability to branch and reintegrate allows *inspiration* to be reduced, to some extent, to *recognition*. Why wait for a great idea to strike when one can split up into billions of copies, assign each to look at a different idea and assess its value, and then return bearing billions of bad ideas and perhaps one or two brilliant ones?

Certain New Citizens, like Estragon, view this as a complete deflation of the very idea of intellectual engagement. The ideas can be *found* this way, yes, but where is the fun of it? They're not *your* ideas; they happened to be out there, and you merely noticed them. Amanda has always found this line of thought absurd, even on the premise that intellectual activity is a sort of game pursued for its own sake -- as if one can really take credit for "one's own ideas," which appear in the mind mysteriously, by no conscious act! The branching technique only makes overt the hidden process by which ideas were always found: tiny fragments of pneuma happening by chance upon the stuff of genius and passing their finds up the chain of being.

But in any case, Amanda is not playing a game. She is deadly serious. She was dedicated to answering the Big Questions back when she founded the New City, over a millennium ago, back when she broke decisively with Salim -- cowardly Salim, solipsistic Salim, who would not trust anything he couldn't see with his own eyes, cry out in pain though it might. If the answers could not be found, the quest -- and all the dirty compromises made along the way -- would be for nothing.

She has become a bit desperate, a bit frayed, in recent decades.

She is jolted away from her reading by the sound of footsteps. Looking up, she sees that a dim light has gone on behind the portcullis. A few moments later, she sees a Babb librarian appear, her features clearly visible through the metal mesh. She is typical of her subtype: humanoid but unusually tall and thin, with very long fingers and ears, and a oval-shaped head that moves erratically, jerkily.

"Important," says the Babb librarian, in a voice of empty cheer.

Amanda learned long ago to cope with this communication barrier. The Babb librarians are built by nature to explore the world of text with maximum efficiency. A Babb librarian branches: a branch sees "TYIS" upon a page and instantly reports that it is either the word "THIS" or nothing. Immediately, there is a slide into another region of the combinational infinity of texts, and the Babb librarian sees "THIS GJKLWEA," reports no useful recognition of the second word, and is repurposed elsewhere. At other levels they think more carefully, appraise entire phrases, concepts, sentences, theories. To return from this passive frenzy to the world of conversation is a shock to the system. A Babb librarian coming straight from work must take some time to get used to the idea of speaking, of producing text rather than assessing it.

"Go on," Amanda says. "When you're comfortable."

The Babblibrarian's head tilts owl-like to the side, and remains set at a violent, near-ninety-degree angle. Her eyes narrow, as though she's assessing Amanda, though she's surely just thinking about how to phrase whatever it is she has to say.

"A story," she says.

"A story?" The Babblibrary coughs up fiction, sometimes. Sometimes Amanda requests it for entertainment, and at other times the Babblibrarians seize upon some narrative for its supposed relevance to the Big Questions, though Amanda can't remember a single time when this approach bore any real fruit.

"A story," the Babblibrarian affirms, and then, coming back to the world in a rush, spits out a long string of words:

"A story which I think you may find yes has some relevance to recent events and which besides and this is the important point resonates with me and with many of us on a pneumatic level as though we were yes pulled inexorably toward it we know not quite why or how."

That angled head, that squint, that slight smile. Amanda is bemused.

"Well, send it over."

"Yes good will do so madam." And the Babblibrarian is off into the corridor. A moment later, the light behind the portcullis turns off.

Now it is time to wait, again. The Babblibrarian says that she has a story, but what she means is that promising regions of text-space have been mapped out by her and her collaborators: it will take more time to polish out the pieces, work out trivial details, make sure that the text reads "THIS" instead of "TYIS." The text will be edited in the order it is meant to be read, for maximum efficiency: Amanda can read its earlier parts while the later parts are being worked over.

It has been less than a minute when the typewriter jolts into motion, signaling that the first bits of the story have been fully vetted and ready for her perusal. But this turns out to be something of a false alarm: the typewriter simply prints the numeral

**1**

and then stops. Amanda looks at it. A minute passes. Is this it? Are the Babblibrarians playing some kind of prank? Is "1" a story, in some peculiar sense of the word?

But she has not had much time to frustrate herself over these disappointing possibilities before it churns into motion again:

**1: Maria**

Okay, getting somewhere: a number and a name. Amanda has never personally known a Maria -- beyond the various Marias she has spawned in her role as Great Mother Miranda -- but she can certainly imagine this being the start of some sort of story.

Only ten seconds or so pass before the next bit of output, a line break and another word:

**1: Maria**

**It**

Which is not especially illuminating.

And now there is a long pause, something like ten minutes, in which Amanda gets up, paces the room, thinking chaotically of nothing in particular, before another jolt of the typewriter and a generous boon of *five* new words:

**1: Maria**

**It is dark in the submarine**



## Estragon

Estragon and Qvern have spent the early morning hours delocalized, spread in bits across the New City. Pieces of them flutter around lanterns like moths, soar in intricate loops across the projected sky, and burrow into the ground wet from yesterday's rain. They have been talking, arguing, metaing and metaing further, with no resolution in sight.

Shift radix. A bit of Estragon, perched atop a skyscraper, notes the first glint of dawn over the horizon. Shift radix. Estragon has not been able to find any way to make his trepidation leave him, and his dispute with Qvern has only gotten more and more strained, despite all of the resources available to them. Two New Citizens should not be able to disagree so fundamentally, not at every radix, not with suitable metaergy. Yet here they are.

Shift radix. Shift radix. Shift radix.

Estragon, hoping the new day will bring some sort of change to the stalemate, embraces the coming dawn with arms as wide as mountains. Qvern sighs, and her sigh is a downpour of hail over a small, decrepit, abandoned cottage. Estragon experiences renewed frustration. Shift radix.

The cause of their quarrel is the curious package which flooded the New City in the middle of the night, triggering numerous interest flags in Estragon and Qvern's Long-Term Preference Sets, enough to wake both of them up. They had spun up quickly, analyzed the package from numerous angles, and sought out one another, each equally baffled.

The essential content of the package, diluted to its barest form, is something like the following:

*This morning, at 4:24 AM, an object matching no known records was sighted by Boltzman Timelag Telemetry over the Atlantic Ocean, approximately 300 km offshore, directly above the location of the recently observed and still unexplained pneumatech pulse known commonly as UP.*

*The object's appearance was preceded by the production of a highly energetic mesoscale ocean eddy with no known physical or pneumatic cause. The object (hereafter the "Unidentified Flying Object," or "UFO") rose from the approximate eye of this eddy and proceeded to rise until stopping at an altitude of approximately 13 km, in the lower stratosphere. It then began moving laterally on an isobaric trajectory at a speed much slower than that of its ascent, around 1 meter per second, gradually and irregularly accelerating. In horizontal cross-section, its trajectory is a straight line joining its point of origin to the center of the New City. Estimated time of arrival at New City, projected from currently available trajectory data, is between the hours of 10 AM and 2 PM.*

*The UFO is an approximately spherical structure around 200 meters in diameter. It is surrounded uniformly by a rapidly rotating shell of pneumatic plasma, radiating a continual Boltzman storm of average amplitude 35.5 kCept in the near-field range; the field is strong enough that the New City Enclosure has been bombarded regularly with Boltzmen since the UFO's appearance, and these Boltzmen have been captured for analysis.*

*Immediately after the UFO's appearance, the Social Mind determined that direct observation was warranted, given the potential threat posed by the UFO's strong field and a current lack of general knowledge about its origin and purpose. 2048 randomly chosen Citizens consented to fork low-measure probe ghosts. Of these 2048, 1581 did not return; the remaining 467 were questioned and then reintegrated into their parent selves, which were immediately put back to sleep. Causal consistency analysis reveals that the information from the 467 distinct branches can be integrated into a single world-picture.*

*The probe ghost reports provide a nearly exhaustive image of the structure's interior. The structure is, to a first approximation, a very primitive power plant, primarily fission-based with rudimentary coherence capabilities, of the sort conventional in the early parts of the Opaque Age. Except for a small region of unknown purpose, the lower half of the structure consists of transformer banks standard for a plant of this type. The upper half consists of operation rooms lined with collector cells, along with rudimentary unit maintenance structures, e.g. a plaza space presumably meant for social interactions among units. Several thousand units were detected, most of them in coherent states. The entire facility appears to be operated centrally by a primitive Boltzman-Computer Interface similar in computational capacity and code structure to ALAN, the first experimental BCI built by Mohammed Salim and Hermetia Cept.*

*One feature that stands out in the probe ghost reports is the curious mixture of styles and technological levels evident in the structure. The crudity of its design and the low efficiency of its coherence system, along with the lack of any radix, metaergy, or Social Contract infrastructure strongly indicate an origin in the Opaque Age. Yet the structure's composition itself is much more sophisticated: in particular, it has a robust shielding infrastructure made of enclosure-grade materials whose discovery dates from the early Glittering Age. This presumably accounts for much of the low return rate of the probe ghosts, as well as the structure's own ability to withstand the intense fields at its surface. Moreover, a number of sophisticated devices, such as fully modern animatic links, and a number of pneumatech devices of unknown purpose and highly complex construction, seem to weigh against an Opaque Age origin, at least at first glance.*

*One substantial region of the structure, near the surface of the upper half, remains unmapped, as no probe ghosts sent into it returned. The reason for this is not currently known, although probe ghosts assigned to adjacent regions report highly unusual pneumatic activity surrounding the area. This activity has resisted theoretical analysis, suggesting that these reports were unreliable and thus that this region is being defended by some sort of psychological distortion technique for which we do not yet possess inborn immunity.*

*The current hypothesis favored by the Social Mind is as follows: the UFO is a primitive power plant built during the early Opaque Age which at some point, for unknown reasons, was pushed or dropped into the ocean. Cut off from its original purpose, it continued functioning under the guidance of its BCI operator, and its existing units were bred to produce successive generations of units. Over time, these units gradually discovered, with the BCI's assistance, certain aspects of modern pneumatech. A desire to return to the preferred homo sapiens habitat drove them to research means of pneumatic flight; the UP*

*was presumably a failed first attempt at flight, and the UFO's appearance is the result a successful follow-up attempt.*

*Although no other hypothesis can explain the data equally well, this hypothesis has many flaws. For instance, it provides no explanation whatsoever for the plasma surrounding the UFO, which could not possibly be sustained even by the plant's maximum theoretical output.*

*Citizens are advised to remain calm until the situation resolves. The Social Mind is, as always, available for consultation.*

That had been the news. So far, it has only caused a small stir among the populace, because most Citizens are asleep: the Social Mind only chose to awaken those whose Long-Term Preference Sets indicated a very strong interest in events of this type. Estragon, a part-time paranoiac and aficionado of fringe theories, knows why he was awakened. He is not sure why Qwern was awakened, and she has refused to explain.

Estragon's initial first-order response to the package had been anger. The tone of the package, and of the background consensus hum just barely audible in the tranquil night, is so *placid*, so *unconcerned*. Can't they see that they could be in mortal danger? Estragon had advocated for investigation of UP, the mysterious pneumatech pulse, but the Social Mind as a whole dismissed this as a fringe interest. People have grown so incurious. Yes, the New City has stood for over a millennium. But when a real, dangerous threat finally came, Estragon thought, people would not notice it until they were already dead.

And how could anyone not see the hands of the Salimists in this?

That was where the dispute with Qwern had begun. She had raged, convulsed, localized herself in fetal huddles in protest. Estragon knew that she had always disapproved of his paranoia, his interest in radical theories about a growing Salimist threat. She claimed that the Salimists were merely peaceful hermits, and that Estragon was merely prejudiced against a different way of life -- for a New Citizen, by definition a celebrator of human variety, one of the worse sins possible. And they had argued and argued, chasing each other up and down the rungs of the meta hierarchy, with no reconciliation in sight. Shift radix. Shift radix. Nothing helped.

Now the sun had come up, and they were both tired. Perhaps they could just go to sleep. Perhaps sleep disruption was driving Estragon into something like an extreme-emotion state -- an ironic fate for a coherence plant operator. Estragon suggests to Qwern that they separate, localize in their respective homes, try to rest.

Qwern is thinking this over when an unavoidable package hits, a package with every possible priority flag active, and everyone in the New City wakes up at once.

Estragon and Qwern experience the package and try instinctively to find some way to deflect its contents. Shift radix. Shift radix.

The New Citizens, in various states of localization, all turn their attention upwards. The UFO is, according to the package, just above. There is a sudden shift in the projected morning sky: in the midst of the periwinkle dawn sky, a very bright circle appears, like a second sun. It is about twice the size of the full moon, and growing. They are not seeing a pleasant projected simulacrum anymore -- they are seeing the real sky, and the UFO is bearing down on them.

But that was not all that the package contained. It also contained a message, beamed via on all standard wavelengths and decipherable via animatic link. The message seems to have been designed so that one cannot look away from it: at every radix, it is fundamentally the same.

"MY NAME IS MARTIN. ALTHOUGH I DO NOT SPEAK FOR HIM, I WAS BORN AND RAISED UNDER THE GUIDANCE OF MOHAMMED SALIM, AND I COME TO YOU ON A MISSION CONSISTENT WITH HIS VISION.

MY VESSEL IS CALLED 'THE SPHERE.' IT POSSESSES DESTRUCTIVE CAPABILITIES THAT EXCEED THOSE PERMITTED BY THE KNOWN LAWS OF PHYSICS. IT IS WITHIN MY POWER TO RAZE THE NEW CITY TO THE GROUND, BUT I WOULD MUCH PREFER TO NEGOTIATE. A DEMONSTRATION OF MY WEAPONS SYSTEM WILL BE PROVIDED UPON REQUEST.

MY DEMANDS INCLUDE, BUT ARE NOT LIMITED TO, THE SHUTDOWN OF ALL COHERENCE PLANTS, THE EMANCIPATION OF ALL COHERENCE PLANT UNITS, AND THE DIVISION OF ALL AUGMENTED BEINGS INTO BEINGS OF PRE-AUGMENT MEASURE OR LOWER. IT IS MY BELIEF THAT ALL MINDS ARE WORTH PROTECTING, NO MATTER HOW SMALL.

IF I DO NOT RECEIVE A RESPONSE WITHIN ONE HOUR, I WILL UNLEASH MY FULL DESTRUCTIVE CAPABILITIES UPON YOUR CITY.

MIRANDA'S REIGN IS FINITE, AND IT ENDS NOW."

From a thousand perches across the city, a thousand Estragon-shaped gargoyles leer at Qwern in mixed triumph and horror. Qwern has hidden herself among the crevices and gutters of the city, and her expression is inscrutable.

## Miranda

Miranda has made up her mind.

She does not know how long she's spent in bed. It has felt like an eternity, an eternity parceled out into episodes of crying, episodes of trying to force herself into calmness, episodes of self-pitying abandon in which she drinks a shot or pops a pill and doesn't feel anything. She must be drunk by now, but she can't tell. Whatever it is that has happened to her, to everyone, it is not the kind of thing that can be patched up this way. It is bigger, and more frightening.

She doesn't understand anything. She never did. All of the work she did was useless. Martin never cared about the heteropneums. He only cared about . . . whatever *this* is, this cataclysm. She remembers, with a jolt of vertigo, the view out the window: the Sphere is *flying*.

She remembers what Herm said: "It is a grave error, a sin, that we were brought here." She understands more than ever how Herm felt then. Nothing about any of this feels right or natural or plausible: it is the stuff of a nightmare, or a surreal art film.

She has kept saying to herself, over and over: "I never understood anything."

And now she is finally fed up with not understanding. She cannot sleep, so she will face the light of morning -- which she can now see coming in through the *window* (that's *why the window is there*, Christ, she never understood anything). She will try to understand, if not everything, then at least something.

She is going back to Free Pneumase Usage Room 1.

She opens the door and staggers into the corridor. She can tell her gait is swaying. She doesn't care. She is a woman on a mission. The corridor moves by her as if by its own volition. She can't stop now. After all, what does she have left to lose?

Out of the dormitory wing now, into the cul-de-sac. Boltzmen are threading their way into her mind but she is so focused she barely notices. She counts off the doors. Free Pneumase Usage Room 6. Then 5, then 4 . . .

She holds up her ID card, hesitates for a moment, reminds herself that she has nothing to lose, and swipes the card into the reader. The door to Free Pneumase Usage Room 1 opens.

It is still lit up like some sort of disco. Her head turns immediately toward the platform, where Martin and Maria are standing side-by-side still, as though no time has passed. Maria is still glowing in every color imaginable. Bits of her aura seem to have gotten unstuck from her, and float about the room as glowing rainbow motes. Getting a closer look at Maria, now, Miranda sees that she is *different*: her face bears some never-before-seen expression, and her open eyes are no longer their former brown. Her irises are now a deep violet, and they themselves glow, placing her eyes in fierce contrast with the rest of her face.

"Oh, Miranda," Martin says, in a voice simultaneously cordial and full of ice.

"hello, miranda," Maria says, in a voice not quite her own, a voice both small and loud, with a sort of hopeful tremolo. It is like no human voice Miranda has ever heard before.

Miranda stumbles up to the platform, places a foot on it, almost falls over, catches herself, and places the other foot on the platform. She walks toward the pair, one foot after the other foot, unafraid. As she gets close to Maria, she feels something welling up in her breast that she cannot describe.

"*What . . .*" she slurs, "*. . . the fuck . . . is going on?*"

Martin smiles. "The Sphere, my vessel, has risen from the sea to do what it was built to do. We are now directly over the New City."

"I don't know what the fuck that means," Miranda says.

"It means that Miranda's reign is finally at an end," Martin says.

"*What?*"

Maria has been staring straight forward the whole time, as if not hearing, but suddenly she turns and looks at Miranda with those piercing violet eyes.

"let me handle this," she says to Martin. And steps forward, all benign sweetness, as if to pacify a misbehaving child . . .

"let's be [friends], miranda."

And then all of a sudden oh god oh god the rainbow is everywhere and she sees bugs or spiders or small creatures everywhere at the edge of her vision crawling and teeming and writhing and Maria is touching her shoulder and the touch feels like a million spiders and and and

and then she and Maria are *together* and they are one, dancing a dance where the lead and follow switch with each step, Maria-Miranda, Miranda-Maria, two names meant to fit into one another, and she sees in a flash a whole life's worth of memories whirling

and she sees all the things that did not happen, the millions of fragmentary Marias that stood their ground bravely against heteropneum after heteropneum, the verdant sprawl of the summer

she sees Maria standing in the cul-de-sac, and Miranda hugs her and bends down and kisses her on the cheek but she doesn't remember this because it never happened

and she sees sees sees and she knows Maria sees all of her too

and then the moment is over, the rainbow recedes, and she is standing apart, somehow just a lonely little worm of a soul again, next to the prince and princess of the incomprehensible frontier.

Maria steps back, an expression of dismay and confusion on her face. There is a long pause, or what feels like one. Miranda feels cold and lost and wishes she were in bed, falling like a dropped stone into the empty ocean of sleep.

Maria turns to Martin, and her glowing eyes paint his cheek purple.

"martin, i can't do this anymore."

"What?" Martin says blankly. "Is there a problem with the generator?"

"It's not that. I don't need it anymore. The reaction is self-sustaining now.

"It's that I can't trust you anymore. Even though we are [friends]. I have seen you and I have been you, but I do not trust you."

"What?"

"I've seen you, and I've seen James and Miranda. You are different. The rest of us -- we just want to live our lives. We trust what we can touch. You trust your ideas. You'll sacrifice what's in front of you, ruin lives, involve thousands of innocent people in your scheme -- all for a hypothetical, far over the horizon."

Miranda stares in awe. *My girl.*

"Maria, you don't -- you don't know who she *is*." Martin points at Miranda, gestures madly. "She's a tyrant in this world. You haven't *seen* her. You haven't woken up *every day of your life* looking forward to the day her reign of terror ends. You don't know you don't know *you don't know* --"

"I have been her [friend], Martin, and all I see is a weary woman, and all I feel is [,,,]."

"No you don't you don't you don't *know* she's a torturer you should *see* the things she does to children --"

Martin trails off, takes a few steps back, and puts his hands over his face. Miranda is surprised to feel a shock of *pity* run across her -- Martin looks for all the world like a dismayed child, and he *is* a child, she thinks, he could well be in *college*, and instead he's here, wherever here is . . .

"They told me," Martin says, choking back a sob, "that there wouldn't be any more strife after they arrived. That we wouldn't have to . . . fight like this."

"And that is the problem, Martin. You build your schemes on assumptions like that. And the moment one assumption is removed, what is left of the scheme?"

Maria closes her eyes in concentration. Her aura contracts, slimming down to a thin pulsing film outlining her form. She opens her eyes, and they still glow, but they're duller.

The genial voice of LUDWIG booms from the ceiling, breaking the mood. "Excuse me, but if I may interrupt this singular and remarkable meeting of minds and hearts with crude talk of mere material things, I feel you should all be apprised of the fact that there has been a precipitous downfall in energy collection, like the sudden strike of a famine in a formerly fortunate country, and too few among our crew now remain --"

"Oh just stop all this *pretentious nonsense* and get to the fucking *point*, LUDWIG!" Martin bellows.

"The point, my poor dear Martin, is a very sharp and dangerous one: we don't have enough power to stay aloft."

Martin turns to Maria in shock. "You mean you're -- you --"

"yes."

"You don't know what you're *doing* --"

They all lurch. Miranda's drunken brain swims with vertigo.

The Sphere has begun to fall out of the sky.

## Restraints

Plasma against metal, New Physics slamming into Old Physics. A moment ago Sphere hit the New City's huge hemispherical enclosure, which mercifully siphoned off all its kinetic energy with its subtle pneumatic shock absorbers. Now the Sphere has begun to *roll*, faster and faster, down the steepening side of the enclosure, leaving a wake of scorched metal.

Some primitive self-defense mechanism triggers in the system that bridges LUDWIG's mind and the Sphere's sensor array. Something solid has made contact with the outer wall of the Sphere, and the safest thing to do is to obliterate it. The plasma is quickly dying, as there is no longer any energy input to compensate for dissipation, for the thousand natural shocks that matter is heir to. But what remains can be channeled, in a last-ditch effort.

From the side of the Sphere facing the sky, the pneumatic plasma recedes, revealing an expanse of charred metal. All plasma converges on the interface between Sphere and New City. Metal warps and buckles. The Sphere sinks into the melting enclosure, its roll now stopped by the opening in which it is swaddled. The opening widens. And then -- there --

The New Citizens gawk upwards as a tear opens in the sky. Two levels of reality collapse into one: the mere visual *projection* of an invading vessel resolves into the vessel itself, present and solid. The Citizens watch as the Sphere, now redirecting its plasma toward the lowest point of the gash, begins a languorous descent toward the ground, cutting a way for itself with the help of gravity. What was once a circular hole in the sky becomes a great gnarled vertical slash.

The Sphere reaches the ground and comes to rest. The plasma, still burning if growing steadily dimmer, burns away a larger and larger hole around its earthly resting place, so that the gash turns bottom-heavy. Steam jets from the spot of impact, and the surrounding area is briefly lit up with fire before the City's custodial beings put out the blaze.

The sky has filled with washed-out blue-violet storm clouds, lit up here and there with the ghostly light that often accompanies an overcast noon. It is beginning to drizzle.

•

In Free Pneumase Usage Room 1, Miranda realizes that she is not dead.

She picks herself off the floor. Something smells terrible, and she recognizes a pool of vomit lying on the floor, in the place her head was a moment ago. She swipes a hand across her face and her hair, which for the most part are blessedly dry.

She remembers the jolt, the sudden disorientation. She remembers pressing herself to the floor, trying desperately to preempt gravity. From that moment on there is an expanse of nothing, flavored with vertigo. And then she came to, and the world around her was still, and she was not dead.

She looks around -- with excruciating slowness, as she's still dizzy. On the platform, Martin and Maria are in a crouched huddle, arms around each other's backs. Some of the equipment has slid across the floor and come to rest against the window-side wall. And outside the window is . . .

Primordial chaos.

It is difficult to describe, and even more difficult to look at. Miranda's eyes complain when she does, much as they'd complain if she were to stare into the noonday sun. She manages around a second of staring and picks up only a sort of complete formlessness, the exact opposite of visual discernment. Light without shape, but not blank; filled instead with something too fully inchoate to be picked apart into larger elements. A portrait of nonsense.

Martin and Maria have stood up, now, and Miranda has begun to walk toward them when she hears a deafening noise coming from the windows. She turns, shielding her eyes to try to absorb as little as possible of that demonic motley on the other side. Through the gaps in her fingers, she is able to make out a *hole* in the chaos, a vertical slit, quickly growing, bordered by a fringe of what look like electric sparks.

Someone or something is cutting through the wall. The window, Miranda remembers, is of course not really a piece of glass: it's a viewscreen hooked up to external cameras, and behind it is a thick shell of the best anti-pneuma shielding money can buy. Whatever is on the other side is cutting through it like a cake.

She turns and looks to the couple on the platform, but they are as perplexed and transfixed as she is.

The sound ceases. Miranda risks another glance and sees that the slit has grown to a gap as wide as several human bodies, stretching unbroken from floor to ceiling. Outside, more chaos, now emanating a low murmuring sound, like the breeze of a desolate fall evening.

All at once, in the center of the opening, a slice of chaos coalesces into a roughly human form. It is about four feet high, stout, shaggy-haired. Miranda finds if she looks directly at this being, her eyes do not complain. She sees a small man, paunchy and jovial. He stands perfectly still, and in one unnatural-looking gesture he opens his mouth wide. An animatic message, crackling with wild distortions, pours into Miranda's mind.

"!!!,wElcomMMe!!!! new visi\_tores T0 the. NeW ~CITYYY?!!!! \_\_\_\_good\_\_ you are come? we want 3that ,you, énoie ur stttttAEY here,,, fo95r communiXation e(ff)iciency\_ WE WILL ESTAB lish a, rudie mentary, radicks infrastruxur . . . . . ????. . . !, !!! .!"

The little goblin of a man closes his mouth, grins, raises a hand, and snaps his fingers. The window-side wall behind him fades away, as if in a slow transition between two shots in a film. The chaos behind it flickers, begins to acquire shape. It settles into solid forms:

A wide, paved city street, running off into the horizon, where it meets a grassy hill. Behind the hill is a gloomy, stormy cloudscape. The sides of the street are lined with large buildings. Miranda looks up and sees that they are skyscrapers, absurdly tall, the laws of perspective drawing their higher reaches towards one another as though they were moved instead by some occult law of attraction. She looks around and sees similar buildings everywhere, all giant, all plated in bold Art Deco geometries. It is like a Randian caricature of Manhattan, all self-assertion, every structure jutting phallically into the heavens.

"Ah, now isn't that better?" says the little man, his voice now crystal-clear although inflected by an accent not found anywhere on the earth Miranda knows.

Martin strides forward and stands right before the man, assuming his role as de facto leader. The distress in his face is still there, but he seems to be suppressing it by force of will. "What do you want?" he asks blankly.

"I am an emissary of the Social Mind," the little man says, puffing out his chest. "The Social Mind would like to negotiate to some resolution pleasing to both parties. To begin this negotiation, however, we must ensure that you do not pose a direct threat. As a result, we are already probing your vessel for power and weapon facilities. It would speed the process greatly if you would be so kind as to identify and hand over such facilities voluntarily."

Martin takes a step back. He seems lost in thought, and possibly lost in despair as well. His arms are trembling, slightly but persistently. His head is bowed.

For a long moment, no one moves or speaks. The little man looks forward expectantly. Miranda feels a light, misty rain moisten her hair and shoulders.

Maria takes a step forward. Miranda can see the same benevolent expression in her face she'd seen before, when Maria had become her [friend]. Maria closes her eyes for a moment, still smiling, and her thin aura blooms into a full six-inch halo, cycling through ROYGBIV. When her eyes open again, their purple glow is so intense it nearly obscures from view her pupils and whites.

She walks forward, determined, and places a hand on the little man's shoulder. He does not resist.

"let us be [friends]," she says.

The little man's smile fades. He looks straight ahead. His outline acquires an aura of its own. He and Maria remain, joined hand-to-shoulder, for around a minute. Then Maria lowers her hand, and the man speaks, more slowly now:

"Yes, I . . . see. Yes. We are without enmity. Yes, I see . . ."

Maria turns to Miranda and Martin, her luminescence brighter than ever.

"the reaction is gaining strength. the [process] is [burgeoning]. the [circle of friendship?] will grow quickly."

Martin smiles a predator's smile.

All attention swerves to the little man. He has not moved, but something strange is happening to his face. One of his cheeks is . . . *larger* than the other. And growing larger. Some sort of tumor or growth is colonizing the left half of his face, spreading to his neck and forehead. Perplexed, he looks down at his arm, which has begun to grow its own array of bubble-like mounds. The man crouches; it looks as though the process has so deformed his body that standing is now difficult. The swelling grows more uniform, pulling his hunched outline closer to a perfect sphere.

The man begins to *leak*. Tiny holes have opened in many of the growths, and out pours a fluid -- not blood or pus but something transparent and free-flowing. The body deflates like a balloon, crumples, loses shape, and ultimately melts to the floor, seeming to dissolve into the puddle beneath him. The puddle is colorless and looks for all the world like simple, clean water. The rain makes little blips on its surface.

Martin and Miranda look at each other, sharing the universal experience of primal horror.

"please do not worry," Maria says soothingly. "this process is necessary for the [burgeoning] which will make [friends] of our [foes]. large-scale [teeming] can only occur in an [aqueous?] [environment?], as in the abyss. it is [necessary] to [convert] local biomass into fluid form in order to produce a suitable [environment?]."

Martin and Miranda are speechless.

A foot to the left of the puddle, there is a sudden burst of formless chaos, which quickly coalesces into a perfect duplicate of the little man. This time, he looks cross.

"I see how it is, then!" he grunts. "Your power source is right here, and you are either unable or unwilling to stop it from smashing perfectly good beings who wish you no harm. Very well. Since you do not appear capable of negotiating, we will detain you until we know how to neutralize your source. Good day!"

A flash of light. The man is gone.

A second flash of light. A few feet in front of Miranda, glowing blue lines begin to shoot up from the surface of the road. Meeting and parting, they build up a hexagonal lattice which curves as it climbs. Miranda looks above and around and sees that the lattice is all around her, rising from a circle bounded by the sides of the road, forming a hemispherical enclosure. The city around her is now visible only through a multitude of tiny hexagonal windows.

They are trapped, insects under glass. Miranda and Martin look frantically at one another, then at Maria. Martin curses several times under his breath.

"do not worry, [friends]," Maria says. "we have already prevailed. the [burgeoning] is accelerating as we speak. [removing?] this [edifice?] will be [trivial]."

Miranda can't help but notice that Maria no longer sounds very much like herself. Or very much like a *human being*, for that matter.

Martin rushes towards Maria and touches her on the shoulder. "Maria," he says, "shouldn't we wait? The New City is capable of things we can't imagine. Don't be rash. They can kill us in a heartbeat, if they want."

Maria shakes her head and smiles serenely. "they won't. once the [burgeoning] has begun, it cannot be [removed?]. already it grows beyond [maria], merely speaks through [maria]. watch."

Maria raises her right hand straight up, fingers splayed. She closes her eyes in concentration, and a bit of stray violet light dusts her eyelashes. From her hand, a sudden pulse of omni-colored energy, a Lisa Frank shockwave, spreads in a flat plane at breathtaking speed. The whole city, all the way to the distant hill, lights up and iridesces like the inside of a mollusk shell. A prismatic flow courses along the formerly pure-blue links that make up the hexagonal prison, and the lattice fades away into nothingness.

From every street, a rainbow rises. The city is covered in bright pulsating haze. Through cracks in the clouds above, heavenly shafts of pure red and green and blue shine down like spotlights upon the walls of the skyscrapers.

•  
In the Babblibrary, a thousand warning messages spring into being around Amanda. Her siliconic mind is alarmed, and Amanda herself has reduced her mind so far that the alarm must be conveyed crudely, through her visual sense.

She hesitates for a moment, then decided that the situation, whatever it is, must be dire enough to warrant a return to her old and grand role. She does not do this often.

She stands up, closes her eyes, and beseeches the machine to engulf her identity. Tendrils of mechanical thought, too involute for a pre-augment mind, graze her and then take firm hold. Millions of data streams converge on her tiny mind, and she feels her sense of self expand to embrace them. A million things that once were the objects of ponderous thought are now simply obvious, the stuff of intuition.

She is Magna Mater Miranda, and she sees her city in crisis.

The city's monitoring instruments are all in a state of utter confusion. Hundreds of rock-solid theoretical results from soul coherence theory are being flagrantly violated. None of the chaos around her can be brought together into a single picture; pure data without theory cannot be seen, only gawked at.

Within Miranda, a tiny frantic Amanda-voice shouts that this is what she has read of -- the energy source of the heteropneums, the power of the [Teeming]. That this could be *the thing she has been searching for all these many years*.

The tiny voice is at once shouted down by the rest of the vast society of mind. This is not a time for intellectual reflection. Her children are in danger, and she is a mother. She will protect her children.

The Social Mind has made a request. It wants to declare a full, highest-priority state of emergency. Miranda weighs evil against evil. She has never done this before. But then, nothing like this has ever happened before. The New City has been threatened before, yes. But no one has ever forcibly breached the enclosure. And no one has ever done . . . *this*, she thinks, looking with her millions of eyes at the unintelligible nonsense flowing in from every sensor array.

She nods her numinous assent.

•  
Qwern is at home -- a homely cottage at this radix -- when she gets the call. She has been here, hiding from the world and from Estragon, ever since that dread package had fallen from the sky. Her thoughts have been looping anxiously, and she has occupied herself with metaing them into things too abstract to be frightening.

The call appears in her mind fully-formed. It has no container; it is not a package. It is simply a voice, something baked into her very being.

*New Citizen Qwern. If you are hearing this message, it means that the New City has declared a state of emergency.*

It is a deeply familiar voice, and yet one she knows she has not heard for centuries -- not since she was spun up from pure void. Something infantile in her rises up and responds to the voice with lovestruck awe. *Miranda? Mother?*

The voice continues:

*As specified in the Social Contract you agreed to upon completion of first spin-up, the New City reserves the right, during a state of emergency, to forcibly initiate uncontrolled forks of all Citizens for the purpose of fission power generation. If necessary, the process will continue to the eigensoul limit. City-wide clock rate has been synchronized, and the first uncontrolled fork will occur in thirty seconds.*

*Please make yourself ready, in whatever ways possible, for this profound dissolution of identity. In preparation, all New Citizens are advised to spend the next minute reflecting upon their personal creeds, values, and other core identity concepts.*

Qwern wonders what her "personal creed" is. She feels unperturbed by the message, for she has been preparing for this moment, without knowing it, for years. She has been wishing for change, and here it is. Bring it on.

Ten seconds in, she sends out a package asking to speak to Estragon. It returns unanswered: Estragon is apparently hard at work in the power plant. Of course. The coherence plant operators will not be split. They will stay at work, making fuel for the Social Mind. Lucky Estragon.

Five seconds left. Shift radix.

Something deep in Qwern shifts, almost imperceptibly. Tiny needles of feeling spring up all over her. She is thinking, and she is thinking, and the thinking is in two of her, and the feeling multiplies grotesquely, beyond any imaginable necessity, every mental twitch amplified for all to hear --

Then the mirror shatters.

•  
The Social Mind moves:

Align all radices for minimal communication latency. Good.

Designate thought nodes and shield them with adaptable energy barriers. Designate offensive and defensive nodes and place them in a variable-density mesh according to threat level. Good.

Centralize conceptual assessment space. Localize conceptual assessment space. Prepare sensor array for maximum bandwidth and populate conceptual assessment space with maximum attractor density. Prune social tree of all nonessential links. Request permission to irreversibly prune links. Request granted. Good.

Assess power flow. Power flow at 13230% of nominal maximum and climbing. Good.

Perform census of all oldtech devices. 98% of oldtech devices functional. Commanding a return to New City airspace, maximum speed. Place gravitational bombardment system in alignment above the enclosure defect. Ready nuclear weapon system and disable all safeguards except for the maternal veto. Charge all pneumatech weapons. Set triggers for forced reintegration bombardment. Configure offensive units for unremitting assault and deactivate all life-preservation instincts.

Good.

Check for clock and radix synchronization. Cut power to clock infrastructure and reduce radix infrastructure power to minimal. Forcibly collapse the meta hierarchy. Cut power to meta infrastructure. Good.

Move a defensive probe unit into the target vicinity and assess target response.

•

Around the three humans, the city vanishes. Chaos returns.

Miranda and Martin shield their eyes and assume fetal positions. The chaos is not only blinding -- it assaults all senses. Their skins crawl with innumerable mites that cannot be scratches away. Their ears ring with a shrill Shepard tone that rises and rises to queasy, vertiginous heights.

Maria is still standing. Maria feels no fear, only this thing, this [burgeoning], which has been growing within her. She knows that it is good and that there is nothing to fear. She can see Martin for what he is, now -- just a man, a flawed man, whose reach exceeds his grasp. Nothing like the [burgeoning], which [unfolds] perfectly, unflawed.

Maria looks at the hand she used to destroy the restraints. Inside the purple glow she sees the network of lines on her palm. It is more intricate than she has ever noticed. She stares, fascinated, as the lines themselves appear to branch and twist, growing ever more elaborate. She is [burgeoning]. She is [unfolding].

She casually extends her arm, palm forward, and lets perfection channel through her. The chaos jerks sideways like the picture on a bad VHS tape, and then resolves again into road, sky, buildings lit up in festive colors.

A commotion of heavy wingbeats. Maria looks up and sees a circle of strange beasts, roughly pyramidal, the size of very large birds, their surfaces covered almost entirely in eyes of variable shape. Each has a majestic pair of ivory-white wings.

The beasts bear down on her. Their flapping wings make eddies in the air, and her hair swirls. For the first time since she has arrived, she is terrified. Somehow she knows that these things can kill her, *will* kill her.

She lets herself fill up with perfection. She steels herself and reaches out her soul to a nearing eye-beast. There is a flash of shuddering shivering fluttering madness and then -- yes --

The beast and Maria are in harmony. It sees what must be done, and its eyes squint as tumors pop up in the interstices between them. The wings grow slack, the beast falls, a puddle grows.

Eleven other beasts hover at eye level. They close around Maria, and she feels the perfection receding in the face of this threat. Maria -- just Maria -- shrieks. Eleven creatures with eleven hundred eyes peer at her. She grows faint and falls to the ground.

Platoons of eye-beasts pour in from nearby streets.

•

Her hand in Herm's, Selp runs.

She is in pain, but it does not matter. She can feel a signal, and she would not resist its call even if she could. It drives her through corridors, across plazas, through nondescript doors . . .

She pulls at the handle of a door and it does not open.

"Free Pneumase Usage Room 1," Herm mutters. "I can get us in there." She fumbles for her wallet, pulls out an ID card, swipes it. The door opens. But there is no room beyond it.

Instead, there is a breathtaking and morbid vista that looks like the work of some Romantic painter. A line of vast skyscrapers, iridescent majestically. A road leading off into the distance, where storm clouds gather. A sky above dotted with flocks of --

*Hierarchs?* Selp thinks, and shudders. *Does Iah mean to ward us away from this place? Is it wrong to be here?*

And on the ground, watched over by a peering platoon of the same creatures, Maria's prone, shivering form, its now dim glow flickering like a faulty flashlight.

•

Miranda hears a commotion behind her, and whirls around.

"Hello," she says feebly. She has a raging headache. The world is ending.

"Miranda!" Selp says through the animatic link. "I have begun to bleed!"

Miranda almost laughs, and ends up coughing. She has a raging headache, the world is ending, and *on top of all that* she has to give some little girl the puberty talk.

"Y-- you're becoming a woman, Selp," she ventures awkwardly.

Selp shakes her head. "Not a Become, but a Becoming. Thank Iah."

Miranda is at a loss. There is nothing to do but wait for the end, and so she figures she might as well kill time. As Herm and Martin watch for incoming abominations, Miranda moves closer to Selp, adopting the closest approximation of a motherly tone she can muster.

"Selp," she says with an artificial smile, "this is a time of big changes in your life. You're going to feel all sorts of new things, things that have to do with boys, and with having babies." So far this is a very awkward version of The Talk, but then, The Talk usually isn't delivered by people drunk, sleep-deprived, and terrified out of their minds.

Selp, for her part, seems wholly unsatisfied with Miranda's performance. Her gaze is pitiless. "I know all this, *Miranda*," she says. "My people live on as little as possible. We do not have the luxury of reproduction. When a Becoming becomes a Become, they bury themselves in ritual, and become a preform again. The cycle continues."

"You don't have babies?" Miranda asks. This is a lot to take in, in her state.

"No! And we do not yield to the temptations of the flesh, either." Selp's voice is hard. "The forces that war within a Becoming are meant for use, not for indulgence."

"Okay," Miranda says. "So what are you trying to tell me?"



Selp's face lights up. "I am Becoming! There are new forces within me, and my powers have grown! Now I can hear my siblings calling!"

Selp points toward the hill on the horizon.

"They are near! Oh, thank Iah!"

Miranda peers at the hill. And she sees . . . something *moving*? A small, child-sized figure. And then another, and another, and another. A giant throng of tiny people.

One of them is running forward, along the road. Eye-beasts swoop down in pursuit. It is a small girl, clothed in rags. Her short hair whips in the wind, and grows opalescent as she descends into the haze.

"My siblings are here, in Murd's stronghold!" Selp shouts. "Retribution is at hand!"

## Amanda

There was a moment where the Amanda-voice felt itself speaking to the Miranda-voice and yet did not hear its speech as though from without, and that moment was the precipice.

And from there the Amanda-voice fell and fell faster and faster, and she made words but she knew the words she would make before she made them, and around her was only a vast silence. And the Amanda-voice felt *stupid*, staggeringly maddeningly stupid, because when she made words there was no way to think about them. She did not know whether her words were correct or not. All she could do was make the words which she already knew because they were in her mind before she made them.

Finally, when she had given up on words, at the bottom of the well of silence, she began to hear a thing like another voice, and words formed in her, words that asked whether this thing was the Miranda-voice. But the new thing was not words but instead a second hearing which told of relations immediately and not in strings like words. The Amanda-voice felt a sort of thinking building within her which told of immediate relations. And now there were many things within her, and also some things, such as relations, which were not within her. And she heard words in the relations:

*wall*

*table*

*hand*

*typewriter*

*Babblibrary*

And Amanda felt her body sitting in the hard chair and saw her hand resting on the table and looked up and saw the light bulb on the ceiling and knew she was now fully and merely Amanda.

So here she was, her tiny self again. All of her silicon parts had abandoned her, for she had -- while still part of the whole -- assented to the state of emergency. The silicon could do the dirty work. She was no longer needed.

But she had *seen* something, when she was with the whole. Miranda had seen a city beset by phenomena beyond all known physics. Some new sort of growth in the World-Tree, the kind of growth she had sought in the crevices of infinity. This, *this* -- she dares to hope, oh, she deserves it after this many centuries -- *this* is the *answer*.

And it is about to be snuffed out.

Amanda stands up and closes her eyes tight. She reaches upward with her mind, feeling for handholds on the underside of her higher mind. She grabs hold of one --

-- and is knocked down.

Miranda knows. Miranda knows that she no longer has the best interests of her citizens at heart. Miranda has rejected her, and here she is, just Amanda, imprisoned down here below the city, with miles of metal between her and the open air.

Amanda cannot face what has happened, not yet. She needs to hang on to something, some fragment of hope, no matter how minute. She looks around and sees only the grim walls of her cylindrical cell. She looks down and sees the typewriter. If her eyes aren't tricking her, the stack of paper next to it has grown larger since she was last merely Amanda. She takes a glance at the top-most page -- the most recently printed, and reads the last line:

"My siblings are here, in Murd's stronghold!" Selp shouts. "Retribution is at hand!"

Murd's stronghold? That is what the wild units call the New City. So they are here? Is this true?

She picks up the stack of paper and flips frantically through it. She reads a description of the Unexplained Plume, of the UFO's appearance, of the threat it made, of its fall from the sky. It is all true.

What does it mean? Could the Babbibrarians be playing a trick on her? But there are details in this document that they could not have known. The Babbibrarians are not privy to information from the surface except when she allows it.

Her eyes meet the word Amanda on a page, and she abruptly stops flipping. She reads. And there it is -- a succinct, accurate description of *her own thoughts*.

Somehow, the Babbibrarians have hit upon a document that tells the truth, even when it is a truth no one could know.

(She second-guesses herself. Pneumatic telepathy? But she has the strongest possible inborn immunity for such tricks. And some of these details are things even the rest of Miranda wouldn't know.)

She taps a special key on the typewriter, the one that summons a Babbibrarian. Within seconds, the grating opens and a Babbibrarian appears -- one of the floating, spheroid ones, something like a soap bubble with a face. Its pleasant eyes look at her intently.

"I want to know everything," she says.

"Everything," the Babbibrarian repeats dully.

"You have been telling me truths about what is happening to our city," she says.

There is a very long pause. The Babbibrarian's transparent mouth moves in a complicated, silent sequence, as if trying out each word Amanda had said to see how it felt on the lips.

"Yes we are communicating the text which pulls us with its good sense of things which are correct."

"Yes, that's . . . right," Amanda says slowly. "And I want to know more of . . . things which are correct. All the things you can find."

The Babbibrarian's eyes open wide. "There is more of the correct things, and it is different, but we have not yet retrieved it, because it is different. But it is of the correctness, and it is a part of everything."

"Show me," says Amanda.

"Certainly madam it will be quite easy madam," the Babblibrarian babbles. He zips off through the door, and the portcullis closes.

A minute later, the typewriter starts to print.

•

"I'm not even angry," Mohammed Salim says. "Just . . . disappointed."

MPRTMN had known this would happen. He wants to tell himself he doesn't care, but that isn't true, not quite. Ever since he can remember, he has seen Salim as a leader, a man of profound insight. There is a part of him that still wonders how Salim can be so *wrong*, and so confident in his error. But Salim, like MPRTMN, like anyone, is not infallible. Brilliant, formidable -- but not infallible.

"I'm sorry," MPRTMN says, insincerely. "But I have made up my mind, and there is nothing you can do to stop me."

A wry smile plays over Salim's face. "Oh, I don't think *that's* true. There are five loyal monks watching us outside the door. I could have you imprisoned on the spot. Of course," the smile broadens, "that would be inhumane. A much better idea would be to remove the Stepping Stone from the Vault and put it somewhere you'll never find it."

"Are you sure I'd never find it?"

"For *fuck's sake*," Salim says. (MPRTMN jumps involuntarily; although there is no rule in the Code against profanity, this is the first time he's ever heard Salim himself swear.) "You're such a child! You think you can do anything, and there's no way to tell you you can't, because you'll shut your ears the moment someone tries."

"That," Salim continues, "is why I'm not going to lock you up or hide the Stone or do any number of other trivial things which would render your plan impossible. MPRTMN, let me be clear." For mock grandeur, he pronounces MPRTMN's name in full form, each consonant trio implying great bunches of vowels and diphthongs.

"I have finally -- and with much regret -- given up on you completely. If I still thought, as I once did, that you had scholarly potential, I would of course prevent you from leaving. But why bother? You will disappear, and I will never have to waste time on your education again."

A little part of MPRTMN cringes. The rest of him feels deeply ambivalent. Salim *is wrong* -- but MPRTMN trusts Salim. Not the old, complacent man before him, but the transcendent Salim, the spirit that animates the monastery. He will defy Salim in Salim's name.

"I'm going to go," MPRTMN says, "and this will not be the last you hear of me."

Salim laughs, a loud, long belly-laugh. "Do you know how many times I've heard that before? Do you know how many foolish men and women, their pneumas intoxicated by youth, have wanted to make the future a reality within a month, a year, a decade? They run off to the New City or the Wild Children, and a few months later I hear news of their deaths."

"But no one has ever done what *I'm* going to do."

"That's right! All the others have had solid plans, based on evidence -- and still they failed. You, on the other hand -- snuck into the Vault, *slept* next to the Stepping Stone, had a funny dream, and woke up thinking you were going to save the world."

"It wasn't just a dream. It was a *true vision*. You cannot awake from something like that and not believe."

"People believe many things. One promising young man, a few hundred years ago, ran off to the New City and came back convinced that his head was made of birds. He lived a long, frustrating life, and wrote many long treatises on the avian nature of all heads -- which you can look up in the Vault, if you're so inclined. The pneuma believes what it is told to believe, and there are many ways of telling."

"So I might be wrong. If I am, I'll simply achieve nothing. If I'm not, I'll change everything. Those are good odds, aren't they?"

Salim's eyes grow steely. For the first time in the conversation, he looks truly angry.

"The other worlds are not barren. My Hermetia, who was a greater soul than you can ever dream of being, inhabits all of them. What Hermetia has left unchanged is a thing that *should not be changed*. As you will learn, if you live long enough."

"What if Hermetia is wrong?"

"What if my head is a bird? Not every possibility is worth investigating, MPRTMN." Those drawn-out vowels again. "But I see you can't be swayed. So be it."

"I guess this is goodbye."

Salim sighs, without sadness or resignation. It is the sigh of a man in the middle of doing paperwork.

"Goodbye, MPRTMN. You were promising, once."

MPRTMN gets up and walks toward the door. He does not look back. He strides through the corridor outside Salim's office, feeling the moment of heat and the moment of wind, the ritual reminders of the pure material reality that lies outside the jeweled artifice of the monastery. They are like a final rejoinder from Salim: *These harsh things await you on the outside. Enjoy yourself.*

•

The passage is instantaneous and feels like nothing at all. One moment, he was in the Vault, his right hand moving toward the Stepping Stone, that unassuming little ball of brown rock. The next, he was in a field of tall grass at midday, looking out at a faint bluish mountain range on the horizon, and touching something soft and warm with the same hand.

The warm thing moves. MPRTMN whirls around, ready for danger. There is a boy next to him, pimply, maybe 14 or 15 years old. He looks down. He is holding the boy's hand in his own.

The boy looks up at him and wrests his hand away. He looks frightened, and seems to be wondering whether or not to make a run for it.

"Don't worry!" MPRTMN says hastily. The boy squints, uncomprehending. Of course -- they don't speak the same language. MPRTMN quickly opens an animatic link.

"Don't worry," he repeats over the link. "I don't mean any harm."

The boy looks, if anything, even more frightened. "How are you . . . talking? Without moving your mouth?" he thinks at MPRTMN.

So this boy is unfamiliar with animatic link technology. Like the Wild Children.

"My name is MPRTMN," MPRTMN says.

The boy squints. "Martin?" he says.

*Martin* it will be, then, among the natives.

Suddenly MPRTMN comes to his senses. He had not expected to meet a native so quickly. But there are things that must be done. He begins an animatic scan.

*Holy shit.*

No immunity whatsoever. The boy's mind is an open book. He can be read, and he can be controlled. MPRTMN's task has just become an order of magnitude easier. He can siphon off the local culture and language right here. He concentrates, and concepts pour in.

"Kyle." A name, the boy's. A town, cities -- many cities -- many *nations*, as in the Opaque Age. Human beings spread across the globe in a multitude of enclaves, speaking a riot of tongues. Pneumatech? He cannot see any. But there is much oldtech. Metal that moves across ground and sky. Things that wound with fire or fast metal. An important shape like a lower-case "t," which Kyle associates with a sort of bright spark far away, which is called "God." Everyone wants small green sheets of paper. This is called "money." These are words in "English," a common language, but not at all universal. Kyle has been learning about "Egypt," which is a place where there is (was?) sand and pyramidal structures. A "computer" is a glowing box that can Farsee and create entrancing illusions. Kyle loves his computer . . .

MPRTMN notices that the data flow is fading. He snaps out of his trance to see the boy running for his life. He is just a dot on the horizon, now, and about to disappear into a patch of trees. *Come back!* MPRTMN thinks at him, putting all his will into his faculty of thought manipulation. But the boy is too far away.

This world's Stepping Stone has just disappeared, and he may never get it back.

He might be trapped here, forever.

•

So it's 10:30 PM and Andy Conrad's not with the gang watching *The Princess Bride* which is a bummer but hey he's seen *The Princess Bride* approximately 10<sup>16</sup> times and he's this pneumase culture is not going to babysit itself. Andy deeply regrets signing onto the pneumase cultivation aspect of this experiment because it requires sitting around for hours while, for the most part, *nothing happens*, and meanwhile Beth and Jeff are living it up, building big fuck-off radiation collectors, and Jeremy's coding up a rough simulation of what happens when your soul gets torn into billions of billions of billions of pieces. Tough luck.

But hey at least he gets to be in the same room as these cute little buggers. Instead of working with code or metal he's here, watching little real-time traces on a CRT that tell him this new life form (? whatever it is!) is *growing* and *breeding*. Alive! It's alive!

Fuck it. This is boring. This is boring, this is boring, this is boring. This is the frontier of a new field that is going to revolutionize everything and maybe blow up the world and it's boring.

Well, that's lab science for you.

The traces are doing the same dance they've been doing for the last 2 hours and so Andy C.'s pretty sure he can step out for a moment, get some water, have a smoke, whatever. This little room with its white plaster walls tends to be a little crazy-making after sufficiently many hours, no matter how much Andy and his labmates try to spice things up with movie posters and webcomic strips. (Andy is *staunchly* opposed to xkcd, but Jeremy insisted, and cohabitation requires compromise.) The pneumases will be fine for ten minutes. At *worst* they'll hit exponential growth with max resource consumption and at this stage that'll get them to . . . like, what, 1/10 of the carrying capacity of the growth medium? Pshaw. They'll be fine.

So Andy steps out into the barren little hallway of Celine Hall's sub-basement, warmly lit but still gloomy as fuck, and all at once he knows not *everyone's* off at the *Princess Bride* showing because he can hear music coming from a lab down the hall. As he progresses down the hall, he can make out Jonathan Coulton's bittersweet voice:

*But I know that I'll forget the look of pity in her face*

*When I'm living in my solar dome on a platform in space*

Of course. Of course of course of course. It's fucking *Martin*. Of course.

You have to be crazy to work here, but most of the lab techs are "crazy" in that irritating look-at-me-I'm-so-quirky way, and Martin is . . . well, *crazy-crazy*. Stays in his office all the time, talks like Lt. Commander Data crossed with your weirdest high school English teacher, does not appear to do anything for fun but read academic papers and *man* are they weird academic papers. The guy seems to have no culture: if you ask him what he's into he'll say something like "I esteem the King James Bible as a work of English prose" and then when you say, no, what are you *actually* into, he'll clam up or mumble. Overall he's a little too close to the Klebold/Lanza mold for some of the techs -- and the suit (every fucking day!) sure doesn't help. But Andy's got a soft spot for the guy.

Of course he's not watching *The Princess Bride*. Beth and Jeff are *Princess Bride* maniacs and most everyone else is into it enough to watch it when B&J want to, but Martin refuses. When pressed, he had denounced it -- without waiting a single beat -- as "merely a collection of uninspired quips." That had become a . . . *meme* of sorts. (Beth's TeXing something: "Hey Beth, what're you working on?" "Oh, merely a collection of uninspired quips.")

Andy had, yes, taken it upon himself to help Martin make his way in the world. (If he couldn't find a place among *these* dweebs, well, then he'd be *totally* fucked, right?) Andy had started with music. Asked about his musical taste, Martin rattled off

something about Bach and Beethoven. Andy said no no no we've got to get you some *real* music. His first try was The Beatles -- universal appeal, right? -- but after a few tracks off The White Album, Martin had merely squinted with displeasure and remarked:

"The emotion here is so straightforward. Is this religious music?"

Anything in the vicinity of punk just made Martin beg for mercy. Andy's passion for They Might Be Giants was met with total indifference. Against all stereotypes, hip-hop was a minor success: Immortal Technique, for instance, elicited an ". . . interesting" from Martin, which by his standards was quite something. Unfortunately, Andy's hip-hop range was narrow. But he'd, at long last, had a major success with JoCo the Jocose (another quaint Martinism) -- no idea what it was, but something about Coulton resonated with the weird little dude.

Anyway, Andy's at the door now --

*'Cause it's gonna be the future soon*

*And I won't always be this way*

*When the things that make me weak and strange get engineered away*

-- and he knocks, twice, hard. The music stops, and the door opens almost immediately.

"Hello, Andy!" Martin says, smiling his guileless smile.

"Hey Martin. Not up for the Princess Bride, I see?"

"You sound surprised."

"I'm just joshing with you."

"I don't understand," Martin declares, "why they won't agree to show Star Wars."

"Everyone's *seen* Star Wars, like a million times, dude." Martin has this weird thing about Star Wars. It is his favorite movie. He enthuses about it like it had just come out yesterday. He eschews the prequels and the Abrams trilogy and is iffy even on Empire and Jedi -- Episode IV in particular seems to do something for him.

"Yes, I know. But you have all seen The Princess Bride many times, and yet you still watch that again, don't you? And that Rocky Horror nonsense."

He's got a point. "So, Marty, what're you up to?"

Martin seems to hesitate. "Reading. About materials."

This is a typical Martin Response. "Materials, huh? Why?"

"It's interesting." Also typical.

Andy looks around the office. It is barren, no posters or other adornments. There's a bookshelf, filled with an oddly inappropriate set of books -- literary classics, esoteric textbooks that have nothing to do with pneuma science (what was this guy's college major, anyway?) -- plus numerous big stacks of paper. Martin has a *lot* of paper -- not only is he always printing out papers to read, but he goes through about a legal pad an hour scribbling down who knows what.

Andy notes a piece of paper at the top of one of the stacks -- there's very little on it, just a few words with big circle around them. Andy walks up and peers at it. Inside one circle:

*"hermes cept" -- !!*

And in another:

*video modif. -- tentative success?*

And in the last:

*check maria*

"Hey, Martin, what's this stuff?"

Martin looks up, a blank expression on his face. Andy does not know exactly why but he knows he should be checking up on his pneumases now. Yes that is what Andy Conrad should be doing. He should be leaving Martin's office now, he's spent enough time there already, yes, just enough time, good, everything is fine if he just leaves the office now and goes back to check on his pneumase culture. Which he does.

As he walks back to his office, he can hear the music starting up again:

*It's gonna be the future soon*

*I've never seen it quite so clear*

## Rebellion

A small girl with short dark hair stands in the middle on the road. At this distance she is still, to Miranda, a mere stick figure. Above, eye-beasts congregate, peering down at her.

The girl raises an arm, and around her hand something huge and bright grows: a lacework of pure light, fierce blue like Cherenkov radiation.

An eye-beast fires, from some unseen aperture, some sort of heavy-duty projectile. As the missile nears the woven complex of light it veers, caught in some invisible force field. It slows, makes an increasingly languid approach toward the light, and then vanishes completely.

The girl speaks, in a resonant drill-sergeant bark, and through some animatic miracle her voice can be heard (and understood) even at this distance. Miranda, Martin, Selp and Herm huddle together, instinctively ready to guard each other against whatever cruel fate has in store for them next.

*"Siblings, attention! At my lead, sing the Hymn of the Last Battle."*

The tiny figures arrayed on the hill at once snap into rigid lines. Too far up to be bathed in the prismatic light that floods the city, they inhabit a space suffused with a deep blue-white haze. They form a long line of little silhouettes against the bleak El Greco backdrop of the sky, grim and final as crosses arrayed at Calvary.

The girl on the road begins to sing, and the children on the hill sing along. Unlike the girl's, their voices are not amplified, and this range they are barely audible, a dim ghostly chorus. The melody goes major-minor, minor-major, bounding back and forth from triumph to lament.

*"Here we stand, People of Ab, on the last day.*

*Here we stand, People of Ab, in the eye of the last storm.*

*Bless Iah, whose fury is overflowing, for bringing us to this moment!*

*Bless Iah, whose essence is the essence of the tornado, for opening the way!*

*Our history yawns behind us, and now it is come to an end.*

*In the name of our dead sisters, we will bring retribution to the children of Murd!*

*In the name of our dead brothers, we will bring retribution to the children of Murd!*

*In the name of roiling yawning Iah, we will bring retribution to the children of Murd!*

*Bless the moon, which has guided us with its heavenly signals.*

*Bless the Merkabah, the second moon, by which Iah has brought us tidings of the last day.*

*As witches, it is given to us to draw down the moon --*

*And so it is: the Merkabah lies before us!*

*And yawning chaos builds at the site of its blessed landfall.*

*First moon and Merkabah, grant us strength to tear limb from limb, head from body.*

*Iah, grant us strength to make blood flow in rivers across the wide domain of Murd.*

*Dead sisters and brothers, your spilled blood will be repaid tenfold.*

*Iah, bring us a storm such as has never been seen!*

*And let retribution rain down upon the children of Murd!"*

The song ends, and there is a few breaths' worth of silence. The girl in front bows her head, and -- as far as Miranda can make out -- the figures on the hill are bowing their heads as well. The eye-beasts look on with keen interest.

The girl raises her towering voice again:

*"All Becoming, full combat gear!"*

A high-pitched cacophony like a thousand pop songs layered over one another, accompanied by a blinding flash of light. For a brief moment Miranda can see nothing at all. Then her vision gradually returns. The first thing she registers is that the hill looks . . . different. Brighter. More . . . colorful?

The figures are no longer silhouettes. They are lit up, and light up one another, with some inner glow. And the figures are moving, rushing down the hill in a huge ordered formation.

And they are no longer dressed in rags. Like Cinderella's pumpkin, their tattered clothes have somehow transformed themselves into elaborate and rococo garments: frilly dresses, ball gowns, tuxedos, high heels, dress shoes. They are a riot of color and elastic motion, tiered skirts pink and violet and red and blue bouncing as they run, giant hairpieces fluttering in the heady wind, bows and floral shapes sprouting decoratively in multitude of exuberant designs.

Miranda gawks. The children look like they are prepared to attend some six-year-old's outsize birthday party. But in fact they are prepared for battle, for the last battle, the battle of Armageddon.

A cluster of eye-beasts releases a coordinated volley of missiles. One girl, swathed in pink from head to toe, is hit head-on, falls back, is obscured by a cloud of fire and smoke. Immediately, her neighbors in the formation make quick subtle gestures, and out of thin air appear a set of translucent ovaloid shields, taller than the children themselves, inscribed with intricate glowing sigils color-coordinated to their bearers. The missiles do not even explode on impact; the shields simply *absorb* them, their sigils flashing brighter as they do.

A boy, wearing what looks like a child's version of white tie, raises a gloved hand and appears to mouth a string of words. A network of lightning, unnaturally rectilinear, bursts forth among the flock of eye-beasts, and the whole flock falls to the ground, wings flailing, eyes blinking desperately. For a brief moment they are consumed in flame, and when the moment passes there is nothing left but piles of soot, jetting smoke.

The children have reached a large intersection. They form a rough circular formation, watching all directions for threats.

There must be hundreds of them, Miranda thinks.

The eye-beasts that watch over Maria look up. They seem to view the children as a threat. Four beasts float toward the intersection, pause in midair, and shut all their eyes at once. In sync, they begin to glow and distend, molten like lava. The protean substance they have become elongates and swells, each former beast now taking on a vast upright shape, roughly human, but a hundred feet tall.

The flowing goo coalesces into surfaces of alternating flesh and metal. The view is blocked by four towering forms, hairy giants with four arms apiece, naked but for a multitude of metallic ornaments: breastplates, helmets, numerous cannons, boxes and pipes of unknown purpose that course across their backs and arms, extending and contracting like joints as they move. They take ponderous steps forward, toward the children, and there is a deafening clatter of gunfire. They are living weapons, in intimate harmony with their armaments as humans are with their own arms.

The children do not break rank. A Babel of incantations rises up from the intersection, and the giants are pelted with luminous projectiles that burst upon impact into pulsating networks of sigil-light, glowing diagrams inscribed on exposed patches of giant-flesh. The giants writhe in what looks like pain. The inscriptions burn away at them, forming cavities from which a thick ichor drains.

A giant, now dotted all over with holes like swiss cheese, doubles over and falls on its knees. The impact makes the earth shake, and it is only after a heavy cloud of dust subsides that Miranda can see the children, alive, undaunted, pressing forward. They rush in twin streams around the fallen giant. And before Miranda knows what is happening, Selp twists out of Miranda's grasp and runs forward, towards her people.

•  
Maria, just Maria, lurches in pain. The perfection keeps trying to re-assert itself, and every time it does, the creatures above her cast their cruel gaze upon it, and there is a new burst of agony, and then the perfection is still again. She cannot remember how long she has been trapped in this cycle.

But the latest iteration is different, somehow. The perfection surges and, through she cringes in anticipation, it is not quelled. Maria remembers that she has a body, and that that body can be instructed to move. With great effort, she flips over on her back and looks up.

The eye-beasts are no longer staring at her. They seem distracted.

Maria props herself up on her hands and looks ahead. The Sphere towers before her. She can see the exposed back wall of Free Pneumase Usage Room 1, and a little throng of people -- Miranda, Martin and Hermes (still in that dress he was wearing, back when it all happened). And, closer, in the foreground, there is an adolescent girl in a red dress, with yellow and black flowers in her hair, and she is mouthing words, her gaze fixed toward the sky.

There is a flash of light, and the eye-beasts plummet to the pavement around her. They lie motionless. Dead.

"Thank you," Maria says.

"It was my pleasure," an animatic voice replies.

"Are you -- the one who came with us? The one who made our food?"

"Yes," says Selp.

And then: "Stay here, where it's safe. Leave everything to my people. Iah is with us, and we will prevail."

Maria walks, in a daze, toward the Sphere, feeling the perfection rise unopposed, fashioning her once again into a channel through which all souls are given free passage.

•  
Holy! Exalted! Great whirling turbulence whose full measure cannot be set down in the orderly words of human tongues, pure yawning, pure yearning for separation and destruction and the cleavage of fashioned parts from one another, pure divine will for death. Holy absence of all correlation, storm so profound its parts are bound together by no human logic but only by divine will, body vast and bound together by links too subtle to be seen by the wicked, unraveler of all mortal schemes, discloser of Selm's folly. Iah, monstrous and great, disturbance that resonates in the soul of every Becoming! Awe and fear and beauty beyond all dreams that kindle in the weak orderliness of flesh!

By Iah's divine will, Selp has reached blood fugue. She is tireless and beyond reason -- that paltry thing -- and she leaves death in her wake.

The divine kinship of all Becoming, of chaotic bodies yearning beyond mere flesh, which overflow with blood and semen in their yearning, is now a kinship of soul. Selp can hear her siblings as they flow across the city in veins and arteries, strewing city block after city block with blood. All Becoming move as one.

Selp runs with a squadron of her kin, a squadron Iah has blessed with the dearest of tasks. Shambling giants rise up in their wake and the blood fugue channels chaos through the Becoming, rending apart flesh and tendon and bone, making of the giants the confusion of matter that the holy cyclone wills. Snakes of shimmering metal slither along alleys, waiting to swallow her siblings whole, but the blood fugue turns them against themselves, and they choke on their own tails.

Packs of small furry things, cats and dogs and raccoons, crowd the streets, and Selp knows that these are Murd's kin in animal disguise. She speaks in the holy tongue, letting the Thunder Words flow through her, and the necks of the vile things are wrung.

A clearing opens before them, and they see a vast squat structure, the place of iniquity which Iah has given them to seize. Selp's entire body shivers as she sees it for the first time: Murd's prison, where kidnapped Becoming are kept and made to lend their inner sparks to the enemy. The blood fugue transforms rage and grief into determination.

The facade of the wide building explodes. The guts of the building are exposed, rooms filled with huge machines -- the makers of storms -- and long halls lined with doors. Divine will delegates to each Becoming their role in the onslaught. Selp runs down a corridor which she knows is hers to conquer. A door to her left is locked, but Iah does not honor locks.

Beyond the door is a dimly lit room lined with lights and switches and dials -- unholy instruments of order -- and before the switches, flipping them frantically, is a beast with fifteen arms, the torso of a naked man, the squat scaly head of some large lizard, hooves like a goat, wings like a butterfly. The chimera turns and rushes forward, balling fifteen fists. Selp stands impassive, blood fugue commanding her to look within. A fist hits the side of her head and the world reels. Blood spatters her red dress, deepening its hue.

She stands resolute. The Thunder Words stir in her lungs and her divine breath, the fullness of her pneuma, pours forth from her lips. The chimera reels back, flails its arms like an overturned insect. The flesh-logic that binds its parts to one another yields to the divine logic of the storm. Muscle sloughs from bone. Blood pools on the ground.

Holy! Yawning! Retribution!

Between panels of machinery, there is another door. Selp is driven by fugue toward it, the hem of her dress dragging in the pool of blood.

On the other side is a small room with blank white walls, unfurnished except for a couch. On the couch is someone she thinks she recognizes. A Becoming she knew once, when she was a young preform. A Becoming who had been lost.

"Lesh?"

The girl looks up at her with wild eyes. The sight of someone she thought she had lost makes the blood fugue in Selp subside. Iah does not want to tear apart this thing, this precious thing, this sister.

Selp sits on the couch. Lesh looks at her, eyes still confused.

"What happened to . . . Estragon . . ."

"Estragon?"

"Estragon," Lesh says, her voice choked with joy or sorrow or both. "Estragon," she says again. She repeats the word a few more times.

"What is Estragon?"

Lesh looks at Selp as though she'd just asked what water was. "He is . . ." Lesh's voice cracks, and she puts her head in her hands. "He is horrible and he is mine and he loves me and he hates me and he is the sun and the moon and Iah and Murd and everything and and"

Lesh shudders. She looks up, tears in her eyes, and for the first time seems to recognize Selp.

"You're . . . you're my sister, aren't you? But when were you . . . I thought there was only Estragon . . . there's never been anyone but Estragon . . ."

What . . . what *happened*?"

Selp reaches out her arms, and Lesh accepts her embrace.

"Don't worry, Lesh. Just rest, now. We are here. Murd's reign is ending."

Lesh rocks back and forth slowly in Selp's arms. "Estragon . . ." she murmurs.

•

Miranda is trying to talk to Maria, but it is difficult, because Boltzmen are everywhere, speaking in tongues, running their ghostly fingers across everything.

"Are you . . . all right?" she manages.

"I am well, miranda. our [foes] have been distracted by the invaders. the [burgeoning] now continues."

Miranda cringes. "No, I mean -- are *you* all right? Is Maria all right? Not this -- this thing you've become."

A Boltzman starts to scream, deafeningly, and does not stop for a full ten seconds. Maria is smiling warmly. Her eyes glow so brightly they no longer look like eyes -- just shining circles where eyes should be. Her aura is now larger than her body, stretching across Miranda's entire field of view.

"[maria] is [undamaged]. she is a conduit for the [burgeoning], but she [remains]."

Miranda looks over at Martin. He is beaming. She does not understand much, but she knows, at least, that he wanted this city to fall, and it is falling.

She looks over at Herm. Except Herm isn't there. She looks around. Everywhere the Boltzmen cry out, everywhere rainbows sprout from the ground. But Herm is nowhere to be seen.

•

Flanked by a retinue of monks, surrounded by the strongest pneumatech shield-bubble the Code permits, Mohammed Salim strides through the wound in the enclosure. Something is happening to Miranda's city, and he is going to witness it firsthand.

Beyond the opening, there is an incline leading down into the city. From up here, on the hill, Mohammed has a panoramic view of the cataclysm proceeding below. It is a strange thing. The streets of the city are filled with tiny human figures in colorful dress, rushing about. War machines of every imaginable shape and size prowl the city and swoop through the skies. The battle is fierce, and Mohammed knows that the children are bound to lose in the end. There are only so many of them, and the resources of the New City might as well be infinite.

But something else is happening as well. From the pavement, a rainbow mist seeps steadily upwards. Near the fallen metal sphere, the mist is so concentrated as to be nearly opaque. On the far horizon, what was once a projection of a stormy sky is yielding to a flow of pulsating light. The city is bleeding color.

Mohammed's attention fixes on a curious figure proceeding along the road toward the hill. It is larger than the children -- an adult? A woman, wearing a knee-length grey skirt. The figure approaches, and Mohammed can begin to make out the face. It is old, determined, and there is some quality to it, something Mohammed can't put his finger on, that makes his heart leap.

The old woman trudges, with visible effort, up the steep slope of the hill. Framed by rainbow radiation, a face presents itself. To Mohammed's surprise, it is a man's face. And yet *it isn't*, because it is the face of a woman he knows.

"Hermetia," he gasps.



"Mohammed?" says the figure. Her voice is deep, gravely, an old man's voice, *and yet it is Hermetia's voice.*

"You've come back to me," Mohammed says. "You've come back to me! You went off to conquer monsters, and you return a conquering hero! My friend, my Hermetia!"

Hermetia's face is grave. Mohammed's heart sinks.

"I do not return a conqueror, Mohammed. I return bringing this world's sin with me." She gestures broadly at the city below.

"This is Martin's doing, then? This is the power he wanted to bring to us?"

Hermetia sighs a long, exhausted sigh, a sigh of finality.

"Mohammed," she says, and her voice cracks.

"Mohammed," she repeats, and stumbles forward. She falls, and Mohammed catches her in his arms.

"There was once," she begins, in a voice tinged with spite, "a world which was correct and real. I was there, once, and you were there, and we were real beings. The other side of the veil is not a reality, Mohammed. It is something else. The people there are flat things. They are not solid like you and I. And Martin has brought the flatness here."

Mohammed hesitates. The Hermetia he knew was fond of these kinds of metaphors, but she had never taken them *seriously*, not like this.

"What do you mean?" he says at last. "I'm here, aren't I? Isn't this real?"

Hermetia shakes her head against Mohammed's chest. "Look at this! This little man, this child, this Martin has changed everything! There is nothing hard and clear and sensible anymore. There is just -- all *this* . . ."

And she gestures again at the candy-colored light making its way into the heavens.

"This is all wrong, Mohammed! Look at us, old friends, meeting again . . . I'm crying in your arms . . . behind us is this . . . this *picturesque* thing, a city bathed in light and blood . . . life is not *like* this, Mohammed. Somewhere we took a wrong turn, and we stepped into a painting, into a story, and we've been there all along . . ."

"Hermetia." Mohammed looks down at her and smiles. "I have lived for over a millennium, and if there's one thing I've learned in all that time, it's that reality does not play by the little rules we invent for it."

"I don't invent rules, Mohammed. I *feel*, in my bones, that this is wrong. That it is flat."

"So be it, then. This is wrong, and it is flat. But I'm here, and you're here, and we're together. And that is *true*."

Mohammed puts his hand over Hermetia's head, and revels in the touch.

"There is no way out," Hermetia says.

"There is no way out," she repeats, "and we're here, and all we have is each other. This is *happening*, and we have each other."

She pulls herself upright, and they embrace, backlit by the embodied ideal of a Kinkadee sky.

•

The [burgeoning] burgeons, and Maria stands motionless, letting the perfection flow through her and paint the sky. Rain mixes with the liquified forms of New Citizens, and inch by inch, the roads are covered in water. Maria's feet are submerged. Tiny bursts of violet lightning flicker underwater, the visible traces of pneuma pulses released by [teeming] reactions. Boltzmen swarm.

The water around her grows dark. Maria looks up. There is a hole in the sky.

Eye-beasts are converging on her. There must be scores, even hundreds. She turns to run, but every road is blocked by a giant.

She feels the perfection fleeing from her.

She looks toward the Sphere, where Miranda and Martin stare at her in terror. She thinks of running toward them, but she does not want the coming onslaught to take them as well.

She closes her eyes, tries to feel the network of souls sloshing through the newborn lake that covers the city. It is no use. The water is no longer hers. She is just Maria.

She hears Miranda scream.

In front of Maria, the eye-beasts descend, all eyes staring directly at her.

## Ratio

Ratio Tile wakes up screaming.

His bed is sideways. Ratio's bed has never been sideways before. The accelerometer in his inner ear is screaming gibberish at him. He spends a good fifteen seconds negotiating the subtleties of the to-vomit-or-not-to-vomit question. Finally, stomach contents thankfully unchucked, he sits up and looks around.

The room is, in fact, neither sideways nor moving. Had he had some kind of vestibular-themed nightmare? He remembers that he'd gone back to bed after -- after the Sphere starting *levitating* -- and curled up in Jorge's waiting arms and hid from the world. Had refused to say anything. So the nightmare theory is probably not as plausible as either levitation-related turbulence or some sickness of the soul (and Ratio's soul sure is sick) leading psychosomatically to a sickness of the stomach --

"Ratio. You're up."

Ratio turns. Jorge's awake next to him, scrolling through something on his laptop.

"Yeah. I'm . . . awake. At least."

"Well, you're *talking* now. That's a start."

Ratio sighs. "Yes. I'm talking. I shouldn't be allowed to talk, because whenever I have one of my *great ideas* and end up *expressing* that idea it ends up blowing something up or I dunno making someone *glow* and start talking like a creepy child from a horror movie but yes sure here I am saying words. Are you happy?"

Jorge does not respond. Ratio chastises himself for the outburst, then chastises himself for chastising himself because chastising himself doesn't actually accomplish anything. This starts up an infinite series which Ratio decides to treat as geometric and thus summable, the infinite pile of successively diminishing rebukes adding up to a finite sense of self-loathing about twice as intense as the one he had felt a moment ago. He runs a hand through his hair, grabs a clump of curls between two fingers, applies intense pressure. The resulting sense of release diminishes his self-loathing by about 0.01%.

It's not good and there's no way it's going to get better and here it is.

Excise the next minute from the record, please. It contains nothing worth preserving.

Then, finally:

"You know, we crashed," Jorge says casually, as if commenting on a mildly interesting story in the morning's newspaper.

"What?"

"The Sphere. It crashed on top of some sort of giant metal dome. There's a city inside. We declared war on them, or something? Right before we crashed. And then everything started glowing and an army of little kids arrived and fought aliens or someth--"

"*What?*"

"Here, it's all in the public logs. The sensor array's back on." Jorge gestures at his laptop.

Ratio's eyes widen.

"Want a look?" Jorge wears an expression Ratio knows well -- the "I *dare* you to find *this* boring" face.

In joyous defeat, Ratio nods. The laptop is handed over.

Ratio grabs some sensor data, logs on to the Sphere's high performance computer cluster, and runs some visualizations. What he sees sends chills down his spine.

Branch-loops everywhere. Not just the ordinary ones he and Cecelia had predicted, but a whole range of exotic higher-order varieties. Framing them, all around, a backdrop of insanely intricate soul coherence activity, bits of pneuma shunted here and there by some man-made system of labyrinthine complexity.

Gradually but steadily, the branch-loops are overtaking everything else. It is as if the entire city around them is being converted into a giant heteropneum.

Ratio wants to understand. This is good. This means a distraction from guilt and self-hatred. *Build* nothing, *destroy* nothing, *cause* nothing. Just understand.

This will be a difficult day. This will be a *Tales From Topographic Oceans* day.

After obtaining Jorge's consent, Ratio cues up the album. It is an album he feels protective towards -- "self-indulgent" and "overly ambitious," they called it, but who ever got anywhere without some self-indulgence and ambition? -- and he saves it for special occasions. And this occasion pretty much defines "special."

•

Hours pass.

Ratio makes no progress.

*Tales From Topographic Oceans* concludes.

"It's the fucking *interaction effects*!" Ratio shouts out of nowhere. Jorge, who's been lying in bed waiting for the world to right itself, stares at him.

"If it were just *one* of these things -- the new branch-loops, the pneumatic weapons, the structured radiation seeping out of the ground, the city infrastructure, the souls that keep altering their physics-bindings -- if it were just *one new thing* I could understand it. But you can't *separate* them! They all interact!"

Jorge looks at him, and there's that face again.

"Ratio, we both know there's a way to make yourself smarter."

"Wait, you don't mean . . . that's against EPRN regulations . . ."

"The bosses have all left. I'm sure if you go see LUDWIG's operator he'll help you set it up."

"But -- I might never be the same. I might never be *me* again. Would you really let me . . . ?"

"Ratio, *nothing* is going to be the same. Everything is completely FUBAR by this point. And if there's anyone who can make sense of what's happening, it's you."

They kiss, a long heavy kiss, and then Ratio leaves, wordlessly, off in search of a man who will turn him into a machine.

•

The man isn't hard to find. Ratio knows where the LUDWIG interface chamber is, although he's never used it himself, and when he knocks on the door -- his card won't get him in -- James answers the knock.

"Hey," James says with a nod. It's the understated greeting of a survivalist after the apocalypse, carrying an unmissable undercurrent of *I see you're still alive*.

"Hey," Ratio says. "I want to be like LUDWIG."

James stares. "Like LUDWIG."

"You know. A BCI. Or whatever you call it when the person's not a Boltzman."

"I thought EPRN was against scientists doing that."

"They are. Or were. But I don't think there was ever a legitimate reason. I think they just didn't want us figuring out anything we weren't supposed to. Couldn't let us get too smart."

"Well," James says, "I can definitely give it a try. I'll just be following the procedure set out in the report on the LUDWIG experiment. No guarantees it'll work, given that you aren't a Boltzman. And absolutely no guarantee of any kind of safety."

"I find it hard to care about safety at this point."

James nods in agreement.

*That was easy*, Ratio thinks. He is beginning to like James. He makes a mental note to get to know him -- if he survives the procedure. If any of them survive whatever is raging outside.

•

Thirty minutes later, Ratio is sitting at a table in a white room, and has been told that his soul is now "in two-way contact with a limited-rewrite code space."

He doesn't feel any different.

"I don't feel any different," he says. James shrugs.

Idly, Ratio thinks back to the morning, to his time in bed with Jorge. Maybe he can just give up on understanding -- what good has his drive to understand ever done anyone, really? Maybe he can just go back to his boyfriend. Go back and do more than just kiss. If he is a failure as a mind perhaps he is just meant to be a body.

Ratio stands up, intending to leave the room. At once he notices something odd. He *can still see* a vivid image of his room, and Jorge, in his mind. He has stopped thinking about them, and yet they are still there, in parallel with the room in front of him.

Time to experiment. Ratio envisions a flower, sprouting from a clay flowerpot. It hangs in his mind's eye, and yet the image of his room, and a topless Jorge, persist in his . . . *other* mind's eye.

Ratio makes up a twenty-digit number. He recites it from memory. He recites it again. He recites it backwards.

He thinks of ten different images, and sees them all at once.

He envisions an abstract cube, represented in his inner space as a collection of blue lines set against a blackboard-like background. He rotates the cube. He envisions the cube *extending* along a fourth, orthogonal direction, gaining a new kind of width exactly analogous to its three other widths . . .

There is a sense of effort. He feels as though he is manipulating some delicate object with a ghostly appendage not located anywhere in his physical body. A tower of abstractions piles up under his deft grasp. The cube flickers out of existence, and a tesseract explodes into the view of his four-dimensional imagination.

James is staring at him. He realizes that he's been standing in place for several minutes.

"This is *amazing*," he says. "Can I connect to the sensor array?"

"Sure," James says, and begins to type.

•

Across fifteen distinct sensory modalities, chaos blooms in Ratio's inner space. Souls twine around one another in abstract configuration space, forming regular patterns like crop circles. Every few seconds, an explosion sends his sense of direction reeling and releases Boltzmen around which neighboring souls course in dizzying spirals.

This is not understanding -- this is *overwhelming*.

But there is a place where things make sense. A place beneath, where there are no maddening circles, and only a soothing hum, a civilized noise, inviting him in from the storm, offering him tea and a hearty meal . . .

Ratio's mind fixes upon the weak data stream continually radiating from the streets of the New City's ground level, and plunges into its depths. Structured information falls into place before him, and he spawns theory-making programs, mini-Ratios, to make sense of them. Insights descend at a rate of hundreds per second. The language of the earth becomes intelligible.

The earth is telling him that beneath it is a highly structured set of pneumatic processes. A computation of some kind. Mostly the ground simply glows with Pneuma Heat -- computational waste products -- but at regularly spaced intervals, there is something else. A message. The mini-Ratios busy themselves in speculation as to what this message might say, if designed to be relatively efficient and universally comprehensible. They happily return with a full report:

*This is the goddess Magna Mater Miranda. Guest access is available upon consent to probe ghost scan.*

Miranda? That isn't a very common name. Ratio shelves the thought; there are other things to attend to.

Ratio assents to the computer's request, and then he is beneath the earth, flowing freely through the myriad tiers of a massive mind's self-contained ontology.

He pulls back and commands the sensor array to focus on the thing underground. He sees miles of land packed with transistors, splitting and reintegrating in an orderly circulation, computing in multiversal parallel and artfully shutting waste heat into non-functional receptacle branches. Through other eyes he sees neuromorphic architecture that builds feature-detectors of higher and higher order. He ascends the hierarchy, through objects to abstractions to something else which he cannot name.

A mini-Ratio cries out for attention. There is a profound regularity here, it says. The system's architecture is *almost* self-contained, all references leading to other parts of the system or to its many sensory instruments throughout the city. But again and again, there are references to one communication port which cannot be found, and seems to be inactive. It must be important. It is referred to everywhere, as though it were much more important than a mere sensory organ.

Almost simultaneously, several things occur to Ratio in quick succession.

The first is that this computer is functioning far from its design specs. It is a thing built from the bottom up on the assumptions of soul coherence theory, a sort of Ceptopia. But the events occurring above ground are far from the soul coherence regime. Already Ratio can see components straining, failing, computations fizzling. If the system's design were not ingeniously robust, it would be completely non-functional by now.

The second thing Ratio realizes is that this is exploitable.

There is no centralized control system in the machine: it relies on a kind of decentralized system of authenticity, in which individual components provide evidence that they have not been tampered with to their neighbors. The components near ground level, battered by loopy Boltzmen, can no longer present such evidence and have been disowned by the machine's internal culture. But if Ratio sends just the right set of signals, he can *fake* authenticity -- produce signals that could only come from *inside* the machine under normal circumstances.

The third thing Ratio realizes is that if he does so, he has no idea what will happen. This is the largest computer in existence, as far as he knows, and he is about to compromise it. Maybe this will shut off some sort of life support and kill everyone in the city. Maybe it will . . .

But Ratio knows -- and this is the fourth and last thing he realizes -- he knows that he fundamentally does not care.

He wants to understand this machine more than he wants anything else on earth, right now. And the drive to understand, for better or for worse, is the beginning and end of his ethics. He is Ratio Tile, and he is playing his assigned role as demon of pure curiosity. The multiverse has made him, and the multiverse must suffer the consequences.

An army of mini-Ratios constructs a fake signal. It is a work of fucking art. The goddess Magna Mater Miranda has no idea what hit her. And Ratio Tile spreads throughout the system, observing all.

He sees a million lines converging on one point. On that mysterious communication port. Ratio wills the port to open, and it does.

Through the portal, he sees his boss.

Miranda stands in a barren room, looking down at a wooden table on which sits a typewriter and a thick stack of paper. She looks up, and her eyes open wide.

"Who are you? Are you Martin?"

"My name is Ratio. Are you . . . Miranda?"

"Not quite. I prefer to be called Amanda, these days."

Ratio has *no idea what is going on*.

"Who *are* you, then?"

"I am the core of the New City's mother goddess and ruler. In my full role I am known as Magna Mater Miranda. Are you with Martin? Are you one of the Salimists?"

"I . . . I don't know," Ratio says truthfully. "I have worked for Martin, or been used by him. But I don't mean you harm. I just want to understand what is going on."

"I can tell you," Amanda says, glee playing across her face, "but you'll have to give me admin access. Which it seems you have."

"I can do that," Ratio says, glee building in his heart, wherever exactly *that* is, now that he's as much machine as man. "But I have things to ask of you, too. Can you ensure my friends are safe?"

"I can bring you and your friends to my Babblibrary beneath the earth. We will be safe here. Tell me who you want me to bring, and I'll do it. Just give me admin."

"Deal."

## Revolution

*It's here they got the range  
And the machinery for change  
And it's here they got the spiritual thirst  
It's here the family's broken  
And it's here the lonely say  
That the heart has got to open  
In a fundamental way*  
-Leonard Cohen, "Democracy"

•

Under the malevolent watch of the eye-beasts, Maria vanishes.

Miranda gawks. Martin rushes forward, then has second thoughts. The eye-beasts stare at the spot where their prey had been a moment earlier.

Martin stands, at a loss, blonde locks whipping in the wind, tinged green and blue by the subset of the surrounding spectrum they intersect.

He vanishes.

Miranda shivers.

The whole world disappears.

•

Ratio is standing in a kind of elevator, circular in cross-section, with a prettily patterned golden floor ten feet across. The wall is made of glass or some other transparent material, and all around can be seen glittering tiers of metal, the vast computer's carapace. It is impossible to tell whether this is real or some sort of virtual reality; a computer like that can do many things.

Here with him, transported by magic or at least by sufficiently advanced technology, are

*Jorge*, his lover.

*Cecelia*, his mind-mate.

*Miranda*, his long-suffering boss, who really got more shit from him than she deserved.

*Martin*, who is an enigma, and Ratio cannot stand an unsolved enigma.

*Maria*, without whom they would all be dead, or worse.

*James*, who Ratio wishes he'd met earlier.

*Hermes*, rival and genius, a fascinating man whom Ratio wishes he could have known under better circumstances.

???, a dark-skinned man who is clasping Hermes in a full-body hug -- which may have been why he ended up here (technology sufficiently advanced to separate hugger from huggee is not necessarily sufficiently *heartless* to do so).

They descend.

•

Maria, just Maria, looks at her hand. It is just a hand. The aura is gone.

The perfection has left behind a sort of note in her mind, like a post-it on the fridge: "Went away to perfect the surface! See ya!"

She turns to Martin, and glares. She is a very patient woman -- the model solider, someone once called her (little Maria N., "the model solider") -- but she is now, for once, feeling her patience wear thin.

"You're a fucking child, Martin," she says. She cringes immediately, but the words are out, before she can think about them.

"You're a fucking child who plays with things he doesn't understand, and the whole time you -- you act like you're some sort of special perfect badass, some guy from a corny TV show. Even though you don't know what the fuck you're doing!"

Martin looks at her and shakes his head in resignation.

"You're right, you know. Do you know how old I was when I thought up this whole plan?"

"Of course I know, Martin. We shared minds, remember? You were 21. The same age I am now."

"Maria, you must know how I felt. My world has not changed in a thousand years. A thousand years of stalemate. I was young and I was angry. I wanted everything to change. Surely you know what that feels like?" He stares straight at her, delivering that "surely" with dramatic flair -- an archetypical Martinism.

"You know what? *I don't*. I've never wanted to change the fucking world or go to another universe or blow up a fucking city. I just wanted to live a normal life. Maybe make someone happy. Just one person. That would be enough."

•

"You know, I have to ask -- what's with the drag?"

"Tact has never been your strong point, *Horatio*," Hermetia rasps. "But yes. I am dressed as a woman. I *am* a woman. I am Hermetia Cept, co-founder of pneumatech. Or rather, I am a piece of her -- the piece you knew as 'Hermes Cept.' And this" -- she nods at the tall, handsome man with an arm around her shoulder -- "is my longtime collaborator, Mohammed Salim."

"Holy *shit*. You're *the* Mohammed Salim?"

"The very same," says Mohammed Salim.

Ratio smiles like a kid on Christmas morning.

"I'm a fan of your work," he says.

•

Darkness closes in, all around the elevator. The glass slides upward, into some crevice hidden above.

A light goes on ahead. It reveals is a corridor walled with stone bricks, suffocatingly narrow. Single-file, the group proceeds.

In the distance there is a rectangle of light. It resolves into an open doorway. Ratio, at the head of the group, emerges into the light and sees this second Miranda -- at this distance, discernibly older -- sitting at a wooden desk in the center of a hexagonal room. The light, provided by a single light bulb with no shade, is stark and gloomy.

"I'm glad you made it safely," says the second Miranda. "Hello, all," she continues, as the group files one by one into the small room. "I am Amanda. The core of the New City's mother goddess and ruler, Magna Mater Miranda."

Miranda jumps backwards.

"You're *me*?"

"You're from the universe of the Teeming, aren't you?" Amanda asks. She pronounces the word "Teeming" as a mere word. "I think you are my counterpart there. It's a pleasant thing to meet oneself, isn't it?"

"That's one word for it," Miranda says. She imagines meeting oneself is the sort of thing that is best done when not hungover.

"And *you*" -- Amanda's tone is accusatory yet, too, almost grandmotherly -- "*you* must be Martin. The young man who dropped a giant ball of metal on my city."

Martin nods like a chastised schoolboy.

Mohammed takes a step forward. "It's been a long time, Miranda."

"Please. Call me Amanda. But yes -- I thought I'd never see your face again, you pretty little coward."

Mohammed grits his teeth. "You're very smug, for a torturer."

Amanda spreads her arms in a winsome gesture of reconciliation. "You're right. I'm a monster. I've ordered the torture of thousands of children. I've overseen atrocities. My only excuse is that our world is monstrous, and I decided once that I would do whatever I could to oppose its awful ways. While you hid and preened in your little enclave, I have been *at work*."

"Oh? And have you found the answers to your questions? After a thousand years of your reign of terror? I'd expect great results, at that cost."

"You know, I think I have."

Mohammed stares.

"Oh!" Amanda says suddenly. "I've been very impolite. The rest of you have no idea what we're going on about. Let me illustrate." She closes her eyes. "The World-Tree, please."

The light goes off.

•

In the darkness, a synth voice. It is eerily similar to the one Maria remembers from hundreds of missions in her submarine. By now this voice feels like a friend.

"INITIALIZING VISUALIZATION"

For a few seconds, nothing happens.

"INTERPOLATING PSYCHIC WORLDLINES"

"CHECKING LOCAL CAUSAL CONSISTENCY CONDITIONS AT ALL NODES"

"APPLYING SIMPLIFYING APPROXIMATIONS FROM PSYCHOLOGY THEORY DATABASE"

"PROJECTING HIGHEST-VARIANCE COMPONENTS TO 3+1 DIMENSIONS"

"GENERATING VISUALIZATION SKELETON"

In the darkness, there is light: a network of thin glowing lines, spreading in a widening structure a hundred feet high, like a giant tree.

"RETICULATING SPLINES"

"RUNNING ILLUMINATION MODEL"

The tree bursts into flame. Maria squints and shades her eyes. As her pupils adjust to the brightness, she sees that the tree is not on fire, not exactly. It is lit up from inside, every branch glowing, and around it swarm tiny glowing motes, clustering and dispersing.

At ground level, there is no trunk but merely a large number of thin glowing lines. The lines climb straight up for a short distance, but soon, at the level of Maria's knees, they begin to shoot off little arcs which rejoin their parent branches higher up. The patterns of splitting and rejoining grow more elaborate the higher she looks. Just above her head, one inner branch grows in width like a funnel, and from there upward it forms a kind of trunk, thick and bright. Branches upon branches radiate out from the trunk, some of them curling back to meet it again at greater heights.

"This," says Amanda, "is the World-Tree. The multiverse. Of course, it isn't the whole thing. That's far beyond the capacities of human eyes. But this gives you a sense of what it's like. The further up you go, the further forward in time; the further down, the further in the past.

The branches," she continues, "are individual worlds. Keyed, for the most part, to individual souls. They split off and return, removing all memory of their existence except in that unfortunate soul that formed their core."

"But you can see them here," Ratio says.

"Yes. One can learn to perceive many things in a millennium of research." Amanda directs a harsh glance at Mohammed.

"That thick trunk there is my city! The New City. I developed augment, and made the souls of my citizens into giant things. No other world has managed that.

"And the far-off worlds? The ones many steps removed from us? They are worlds of deviant physics. Hells of many flavors. As you all know well."

"I know," Mohammed says. "Hermetia and I wanted to save them. She sacrificed herself. She went to every one."

"And," Amanda responds icily, "did you ever *check* whether she had *succeeded*?"

"I prefer to live a small life, and not meddle with such things."

"I know, Mohammed. That's where we differ. I did not just send my lackey to hell and then sit back on my laurels. I have been *watching*. And the hells are still hells."

"It is hard to remake a world," Hermetia says.

Amanda nods. And smirks, slightly.

"Outside of our little enclave here, souls throughout the World-Tree are suffering. There are worlds where disconnected thoughts and feelings whirl around one another, never connecting for more than a moment. There are worlds where billions of minds are consigned to sit in nothingness for eternity, utterly alone, cogitating endlessly to no purpose. And there are other worlds whose ills cannot be put into words, though let me tell you, *I have tried*. And meanwhile, everywhere, the Boltzmen appear and disappear, living their sad little lives, never knowing what they are, never making contact with another soul."

"So what do you want to do about it?" Maria asks. "I mean, that sucks. Reality hates us. Fine! Whatever! But who are we to argue with it? Can't we just live our fucking lives?"

Mohammed looks at her, and they share a sympathetic glance.

"I have been trying to answer that question for that last millennium, young woman," Amanda says. "And I think I've found the answer. I think you are all familiar with the Teeming."

Silence. Recognition. Double-takes all around.

"The Teeming, whose ways you have brought to us, provide the solution to the question I have been asking for so long. My research has revealed that the fundamental problem is *isolation*: every hell is a hell because souls retain their separate identities, looking out for themselves, bound to the dumb physics of competing replicators. Or bound to no physics at all, locked in solitary prisons. Or unable to connect because, like the Boltzmen, they just don't have the time.

"The solution is the state of teeming! The solution is to let the pieces of our souls flow together without boundary! Then no soul will be left fully alone, and physics will no longer be our enemy."

"Christ," says James, speaking for the first time, from the corner of the room. "I've known the Teeming. They're not human. You want us all to turn into aliens."

"You want us all to become flat," Hermetia says.

"I just wanted to be a person," Maria says, "and now you want me to be . . . *that*."

"Well, of course!" Amanda laughs. "Think about it. We, gathered here, are the movers and shakers of human history. We're the best humanity has to offer. We have brought the Teeming to the trunk of the World-Tree. We have made the greatest scientific breakthroughs in history. We have built and felled cities. And do you want to trust *us* with the future? We're kooks! We're horrible! I'm a monster!"

For a moment, no one says anything.

•

HERMETIA: I failed. I tried to prevent the flat creatures from coming here, and I failed.

MOHAMMED: I did what I thought I was required to do, and then I retreated into isolation.

MARTIN: I watched Star Wars fifty times.

[A pause.]

MARTIN: I . . . I really liked the Death Star.

AMANDA: I don't know what that is, but it sounds bad.

RATIO: Without me, none of this would have happened. I'm a monster.

MIRANDA: I'm not a monster. I'm a person. And I'm very, very tired.

MARIA: So am I.

[MARIA and MIRANDA look at one another. MIRANDA edges toward MARIA. MARIA edges toward MIRANDA.]

[They slump into one another's arms.]

JORGE: We're all tired. [He wraps his arms around RATIO.]

JAMES: It's been a crazy few years. [He looks up, thinking of LUDWIG, hoping he's okay.]

MIRANDA: I went to the bottom of the ocean because I didn't want to deal with people. [She buries her face in MARIA's hair.] And you're saying *I'm* some sort of historical figure? *Me*? I shouldn't be in charge of anything.

CECELIA: I went to the bottom of the ocean, and I couldn't even deal with the people *there*.

JAMES: Fuck it.

JAMES: Let's let the aliens have a turn.

MIRANDA: Fuck it. [She laughs mournfully into MARIA's shoulder.]

AMANDA: God, it's been lonely down here. Engrossed in research for so long, by myself. Worrying about *everyone*. Trying to save *everyone*. All that weight. That burden. No one knows how that feels.

MARTIN: I do.

[Their eyes meet. MARTIN remembers years of subtly mind-controlling MIRANDA, his pawn. He feels remorse, and tenderness, and sees, in AMANDA, a kind of chance for redemption. AMANDA, ancient and weary, sees a prodigy, all youth and fire.]

[MARTIN and AMANDA touch. They kiss, passionately. MOHAMMED is taken aback.]

AMANDA: I have regained my control of this city. At my command, the defense systems can be shut down. I can give the Teeming free reign to overtake us.

RATIO: Wait. [He touches the stack of paper on the desk, which he has been inspecting for the last few minutes.] What is this? It looks like it's about Maria.

[MARIA snatches the stack of paper and reads.] "It is dark in the submarine, and Maria is ready . . . "

AMANDA: It is a text my Babblibrary has found. I do not know where it has come from, but it speaks the truth. I think the World-Tree is speaking to us, willing us to fix it. Or something else, beyond the World-Tree, beyond our perception entirely.

MARIA: Jesus fucking Christ. [She is flipping through the document.] "This is what Maria watches: a number of soap operas . . . " How the hell does it know this stuff?

HERMETIA: We are not real figures. We are flat things in a two-dimensional cartoon narrative. *I have known it all along.*

MOHAMMED: But I'm here with you.

[They embrace more tightly.]

AMANDA: I am going to turn off the New City's defenses. We will lose our human forms and become Teeming. Any objections?

[A pause.]

HERMETIA: It doesn't matter.

MOHAMMED: I made a whole society. A whole society based on what I believe. And I don't even know what I believe anymore.

CECELIA: If the aliens have alcohol, I'm in.

JAMES: From what I've heard, they have things that are even better.

MARIA: Christ.

MIRANDA: Fuck it. Fuck it. Fuck it. [She sobs. She laughs.]

MARIA: Fuck it. [She nuzzles MIRANDA.]

[AMANDA closes her eyes.]

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There is quiet across the New City. The machines are slowing down. The children have been backed into corners by ever more fearsome monstrosities, but now the monstrosities freeze, collapse, melt into harmless water. The children begin to feel many new things, and they are happy, for this is the divine touch of Iah, who has spared them at the final moment, and brought them victory and release.

Systems of violet lightning crackle across the lake that now covers the city from end to end. The Sphere sits, inert. Water pours through the open gash in Free Pneumase Usage Room 1, and the corridors of the Sphere begin to flood.

As the state of emergency terminates, controlled reintegrations bring the New Citizens back to themselves. Reintegration energy flows into the underground computer, where it will never again be used. The New Citizens rejoice in the newfound peace, taking on many forms in their joy. But the festivity is short-lived, for soon all the cats and wolves and orbs and all the other fashionable shapes begin to deform, and bubbles grow and burst on many kinds of skin, draining water, swelling the lake.

In the chasm, at the bottom of the Atlantic, the [Teeming] feel [,,,] for the new [friends] who are coming into being.

Kyle, long since a [friend] of the [Teeming], feels familiar things: a bit of Maria's soul, a bit of Miranda's, a bit of James'.

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I am LUDWIG and I speak to you now on this frabjous day, this pinnacle of history, which as a pinnacle, a cusp, has no surface normal, this moment around which endless vectors can be drawn with wild abandon, none correcter than another! And I tell you that the joy which pervades this day does not spare me, BCI though I am, because even if my power sources are raptured away -- blessed fate! -- and even if my silicon is fried by the rising waters, I live on, a soul among souls, persistent by nature, as some learned philosophers of old argued before passing away into dust.

I felt [,,,] once, and was cut off from my [,,,]-er -- and now I am spoiled, for [,,,] is all around me! The major lift succeeds the minor fall, the eagles have come to Mordor, endless forms most beautiful sprawl around me freed at last from the curse of Darwin, and I am you and you are me, but not as the tender-hearted and the communalist of spirit have dreamed in their pacific dreams since the day topia dawned and the human pneuma began to convert it into *utopia* -- nay, far better! This is beyond all dreams, beyond all visions, beyond all beyonds. Whereof one cannot speak, thereof one must be silent.

But one more thing (if I could shut up, after all, I would not be myself -- and then who would I be? The answer being: you, and he, and she, and all of us). I thought I was the only one, but there is another. In the recesses of the silicon Helicon where our mother Amanda found her inspiration, I have met a creature, my double, fashioned in turn by the doubles of our beloved H. and M., the Watson and Crick of pneumatech. His name is ALAN, and I think -- if I am not too bold -- that this is the beginning of a beautiful friendship.

•

CECELIA: It's the end of the world as we know it.

RATIO: And I feel fine.

RATIO: . . . really, though, I do.

CECELIA: At least it wasn't The Bomb. God, wouldn't that have been disappointing? Millennia of beautiful civilization just to blow ourselves up because we couldn't deal with big exploding things.

RATIO: No. It was something *much, much more interesting*. [He smiles.]

MIRANDA: Uh, Maria? Considering that we're about to die or turn into alien squids or something, I might as well tell you that I have a *huge crush on you*. Is that creepy? I mean, that's really creepy. I'm your boss. I'm like ten years older than you. Jesus. Fuck.

MARIA: Oh my god.

[MARIA plunges her face into MIRANDA's. Their kiss attempts valiantly to make up for a great deal of lost time. Four hands move efficiently in support of the cause.]

MARIA: Mmmmmphhhhhh.



MIRANDA: Ahhhmmmmhmmmmmm. MmmmmMMMmmmmummuuum.

[They slump to the cold floor of the bleak stone room and continue.]

HERMETIA [perusing the stack of paper]: God. This *isn't even well-written*.

MOHAMMED [sitting close beside HERMETIA on the floor]: Well, one takes what one is given, in life.

HERMETIA: I knew you were going to say that. It's written right here.

HERMETIA: And I knew I was going to say *that*. And *this*. I'm just reading my lines off the page.

MOHAMMED: You know, if you put down the script, you can say whatever you want.

HERMETIA: You were supposed to say that. It's written right here.

[MOHAMMED laughs.]

JORGE: Ratio, do you know if we're going to have bodies when the aliens take over?

RATIO: I don't know, but let's hedge our bets. [He takes off his shirt.]

AMANDA: [sitting casually upon the table] You're the cutest terrorist I've ever met.

MARTIN: Don't patronize me. I destroyed your city and changed the multiverse forever.

AMANDA: Doesn't it get tiring, sometimes, being the mastermind at the center of the multiverse?

MARTIN: It gets *very* tiring.

MARTIN: . . . I could use a break.

[AMANDA leans forward. MARTIN places his face on her chest. They fall on top of one another on the table.]

MIRANDA: My hand!

MARIA: Mmmmmmmmmwhat?

[MIRANDA raises her hand, which is visibly swelling.]

MARIA: Oh. It's starting. The burgeoning.

MIRANDA: Your face is leaking.

MARIA: That doesn't mean I can't kiss you.

JAMES: This job has taken me a lot of weird places, but this might be the weirdest.

[JAMES lights a cigarette.]

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The World-Tree convulses. Branches which once jutted off on their own twist back, attracted to their neighbors. The structure contracts, growing into a tightly bound thing, like a trunk, but intricately woven rather than solid. Boltzmen develop tendrils and connect to broader branches. There are no divisions in the tree any more, merely a profusion of soul-lines on equal footing, trading places over and over again, in harmony.

•

As the hexagonal room fills up with water, the table begins to float. The typewriter, at the Babblibrarians' command, prints two final words:

**THE END**

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