



Image source:
The Resurrection of the Dead,
by Victor Louis Mottez (1809-1897)

The Last Trumpet Project

A Novel

By

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Rev. 1.2

To the young people of this world

Immortal ones, you shall inherit not only the earth,
but the universe.

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I conceive that the great part of the miseries of mankind are brought upon them by false estimates they have made of the value of things.
-- [Benjamin Franklin](#) (1706 - 1790)

Prologue
26 December, 2044

The northern lights were unusually bright tonight, twisting like a sheet of cold blue fire above the horizon. Such displays were uncommon at this latitude in British Columbia. The eerie glare provided little practical utility to the men toiling on the steep, snow-covered slope, but did seem to some of them like a token of heaven's favor, or at least of its acute interest. It was cold out here in the wilderness in these early morning hours of the day after Christmas, and hearts as well as bodies were hungry for warmth.

Brother Shawn stood over his seismic scanner with his eyes glued to the data screen, which lit his anxious face with a glow not unlike the aurora. His tension was understandable. Just a few yards from him, his compatriots were confirming the readiness of an explosive device which they had lowered more than a hundred feet into a hole drilled into the dirt and loose rock beneath their feet. The core driller loomed to one side, its tractor-like wheels bolstered by braces deployed flat against the ground to keep it from tipping, its drill head poised to strike again on command, like a giant mechanical woodpecker lodged in a snowbank.

Three more such machines, each attended by a knot of men, surrounded them at distances of a hundred yards or so. But it was not his laboring brethren or their equipment which held Shawn's attention whenever he looked up from his monitor to glance at the ridge line above him. There was no mistaking the fact that the crest of the dam was now visibly subsiding, and a grey stain of water had begun to appear over the lip. Booming reports echoed back to them off the surrounding pine-clad hills as sheets of ice cracked across the face of the lake. Shawn was only too aware of the mass of thousands of tons of icy water which hung precariously

suspended above them, walled off by a barrier which his own scanner confirmed was weakening by the moment.

This antique earthen dam had proven much more difficult to undermine than they had planned. Even with the scanner, it was difficult to pinpoint reliably its most vulnerable structural points. The charge being readied beside him would be their fifth unanticipated *coup de grace*. Fortunately they had brought plenty of extra explosives. Despite its remoteness, the dam simply could not be left standing with clear evidence of sabotage.

"We're good to go, here," the team's explosives technician confirmed. The team leader looked inquiringly at Brother Shawn.

"Ready, go ahead," he said steadily.

"Fire in the hole, then." Controls were activated. After only a second's delay, the ground lurched beneath their feet, and a rumbling bellow swelled out under the night sky. It was accompanied by a tearing metallic shriek like the collapse of something made of steel. Which seemed odd, because there was no steel in the body of this dam. Shawn studied his readouts intently.

"Well?" came the query after a minute.

"All the weakening was in the lower third. We're gonna need the next one, higher up." The leader gripped the mic on his jacket with gloved hands and relayed instructions to one of the other teams, upslope from them and to their left. Shortly the vibration of another explosion thrummed beneath their boots. The result was immediately apparent, even without the aid of the seismic imaging scanner. The center of the vast earthen berm began to droop, and more water began trickling over it, darkening the snow.

"That's it this time, no question," Shawn confirmed. "It's gone in a matter of minutes."

"All right, pack 'em up and move 'em out. Come on brothers, let's go!" Their squad leader had no need to motivate his men. Shawn and a teammate uprooted the scanner's sensor arm and bundled the device onto a sled attached behind the mobile driller. The latter was made ready for

travel and its engine fired up with a roar. The tense surrounding winter quiet disintegrated as the other teams did likewise.

The nervous men jumped onto the uphill side of the driller and hung on as it lurched into motion. The tractor wheels churned as it skidded and clawed its way at an angle across the slope, making for the top of the dam on the side opposite the empty spillway. Each slew of the wheels made the ungainly vehicle forfeit some hard won altitude, almost as if the dam were reluctant to permit its destroyers to escape. The men watched above them with trepidation, grudging every heart-pounding sideways lurch that lengthened their course. Shawn kept glancing at his chronometer. Five minutes, six.

At last the machine crawled up onto safe level ground, and the crew leaped off as it shuddered to a stop. From here, looking along the top of the dam lengthwise, one could see just how much the center section had subsided. It was now concave enough to permit a steady stream of eager black water to run down its outer face. A distinct bulge was also developing down at the base in the center, as water flowed invisibly into the interior core of the doomed dam itself. Shawn knew he should probably hook up his scanner again so that he could capture and record the climax with hard numbers, but he couldn't tear himself away from the spectacle he was witnessing with his own eyes.

The last demolition team, who had been farthest down the dam, now reached safety too, and the mood of the gathered men began to turn toward celebration. Cold feet and sweaty palms no longer seemed to matter. They had done it, and the rest was now in the hands of God.

Despite their expectations, it was nearly another twenty minutes before the center of the old dam disintegrated in almost the drawing of a breath. A wall of water and debris blasted out as if a huge invisible fist had punched through it at the last moment, and curled like an angry arm over the valley below, pummeling the ground. The roar of the avalanche covered the cracking and grinding reports of shattering ice as spray soaked the

watching men on the cliff, who were now leaping and cheering. Their cries were lost in the rush of destruction, the ancient self-vindicating battle howl of crusaders of ages past:

"God wills it! God wills it!"

The giddy madness of nature and of man subsided into an aghast silence.

Behold I tell you a mystery: we shall not all sleep, but we shall all be changed, in a moment, in the twinkling of an eye, at the last trumpet.
– I Corinthians XV, 51, 52

Chapter 1
The Resurrection of Craig Stenson
Two months earlier

A human hand moved a slider control, very carefully, in the manner of one making a final delicate adjustment. Its forefinger tapped on an adjacent digital indicator, expressing both confirmation and satisfaction. Nearby, a three-dimensional holographic display came to life and began to show what appeared to be a city street scene, early evening, in damp weather.

“I think we're ready,” said a deep voice. The speaker took his hands off the control panel, leaned back in his chair a little bit, and faced the dozen other people seated around the lab. They were of both genders, apparently young to middle-aged, all looking at the holo-display with solemn interest mingled with excitement.

“So that's the street where it happened?” asked a young red-haired woman in a trim business suit.

“Will happen. We're a half hour or so early. Justin, would you confirm the precise coordinates, please?”

A man with sandy hair and pale blue eyes stirred in his chair. “Certainly,” he said, rummaging in his jacket pocket. He produced a data stick and handed it across the small space between them, both men leaning forward slightly in their chairs to facilitate the transaction. “Those are the exact time and GPS coordinates from the moment when Craig had his accident,” Justin confirmed for the benefit of the others in the room. “Stefan will now program a tracking trajectory for the Cronus Scanner so that we will be able to watch the location beginning several minutes before the event.”

“Right,” said Stefan, turning back to his controls with the stick, which he

inserted into a reader with one hand while the other played smoothly over a touch pad. A balding, darkly bearded man of middle age, his deep voice effortlessly took on the tones of a seasoned lecturer. "As you know, Earth GPS coordinates change continuously as the planet, its solar system, and its galaxy hurtle through space. The Scanner adjusts for these positional changes automatically as a function of the time interval, so that we see continuous sequential images from the correct spatial coordinates in the viewer."

"What's the temporal scanning resolution?" someone asked.

Stefan flashed the questioner a brief smile over his shoulder. "Microseconds," he replied.

"With enough bandwidth to support a full quantum brain scan," Justin added. He and Stefan exchanged a smile that was both awed and amused.

The woman in the business suit sighed. "That's impressive, but you know where it will lead." For a moment the gathering became even more solemn. Stefan shrugged.

"We know. We've talked about it, we've all made plans for it. The consensus has always been that it's a place we have to go."

"Not doing it would be indefensible," Justin said with the air of one repeating a sound conclusion validly, however reluctantly, arrived at. No one disagreed.

"What about the brain upload side?" another voice asked.

Justin turned in his chair to face the rest of the group. "All prepared with the necessary resources standing by," he replied. No one questioned him further. Each of them had, after all, been through it themselves.

"I feel like I should make a speech of some kind," Stefan said with a wry grin. "But I'll leave speeches on the significance of it all to the commentators after the fact. For now, suffice it to say that we are peering through the Cronus Scanner back in time to that fateful evening in late November, 2038, when Craig Stenson suffered an accident which was immediately fatal. Many of you knew Craig. That's a large part of the

reason why he's our first human test subject. We have every confidence, from the Cronus quantscans we've done on objects, plants and animals, that this is going to work perfectly. The implications are much greater when it's a human being involved, but the operating principles are identical. The viewer is now displaying the scene approximately T-minus five minutes prior to the event."

Evidently no one had any further questions or comments. All eyes turned to the holo-viewer, which was located more or less in the center of the lab. Stefan touched another control and an auditory system activated, allowing the participants to hear as well as see back in time. The novelty of watching an audio-visual stream which was generated in response to data being recorded by a passive temporal scanner that was reporting on the changing state of everything in its vicinity, right down to the states of individual atoms and photons, kept the group silent for several minutes. Some very elegant hyperdimensional mathematics was being employed here, along with a prodigious amount of real-time computation.

A number of robotic ground cars came down the street and disappeared out of the field of view. Some of these contained passengers and some did not. Just as the time display clicked inside of T-minus one minute, another ground car came in sight. The camera perspective was situated under a kind of pedestrian overpass, which appeared to be under construction, or repair. As this latest ground car approached, the street began to tremble, then to vibrate, and there was a rumbling noise. The partially completed overpass swayed and began to buckle.

As the ground car arrived at the scene, the focus zoomed in slightly to reveal a single male passenger, and as the overpass began to fall on top of it, the picture froze altogether as Stefan touched another control. There was a pregnant pause. Somewhere in the cyberverses, mighty computing engines abandoned their idle loops and turned to the task of crunching the data which represented a man, down to the probable energy state of the least electron in his body, and transplanting that processed information

onto a digital computing substrate which could likewise run the software of his mind and consciousness – though faster and far more efficiently than his biological brain ever had.

“Scan successful; we have him,” Stefan announced. Excitement held the room in stasis, except for Justin who was examining a palmtop display in his lap.

“Verifying correctness of the instantiation model,” he said in a low but cautionary tone, like one holding up his hand to forestall an outburst of applause. This took only a minute or so as the computing network rechecked its work. This was a man's life; mistakes could not be afforded.

“Looks good,” Justin concluded, looking up. “I'm going to bring him here. Hopefully this will be his only involuntary virtual instantiation ever,” he said impishly. Several of the others smiled.

Suddenly a man was sitting in the room with them, in one of the chairs that had been empty. Recognizably the same man they had all glimpsed riding in the ground car, he looked to be in his middle forties, of average height, brown-haired with a bit of distinguished grey at the temples, and a slight paunch punctuating an otherwise slim frame. His expression was one of mild disorientation, like someone awakened out of a dream or coming back from woolgathering with a start.

“Craig? Are you all right? How do you feel?” Justin asked solicitously.

“Justin? What the—” he asked in obvious confusion, then looked around more widely. “Stefan? Kara. Marina, Ray?” he added as he recognized several other people in the room. These murmured greetings or waved or nodded in response. “I don't get it, why are you all here? Where am I? What's going on?”

“Welcome to the Singularity, Craig!” said the young woman in business attire, with a warm smile.

“Huh?” For a moment that pronouncement didn't reduce Craig's confusion. He was focused on the peculiar fact that this woman looked younger than he remembered her. Then suddenly it all added up for him.

“You mean I'm – we're all–”

“It's true, my friend,” Stefan said reaching over to shake Craig's hand. “The Singularity was proclaimed on March 1st, 2042. Fully non-biological humans. Total virtual intelligence. Everything we always talked about and worked toward. We are of course at this moment instantiated into a virtual environment where our avatars can meet, and which also provides suitable interfaces to enable us to control the computing and other resources that brought you here.” He gestured at the panels behind him.

“Right.” Craig knew all about full-immersion virtual environments and avatars, since those had been ubiquitous by 2030. “So when is it now?”

“It's October the 27th, 2044,” Justin answered.

“Okay, so why am I missing about six years that I don't remember?”

Stefan gave him a reassuring grin. “Because you never experienced them. We brought you forward in time, as it were.”

“Time travel? Why?”

“I'm sorry, but we had no choice, Craig,” Justin said apologetically, and pointed at the holo-monitor where the image of Craig in his ground car was still frozen. Stefan zoomed the focus back out some so that the tons of debris descending toward the car's roof could be seen.

“You remember riding along in that car, right?” Justin asked, and Craig nodded. “Recently, Stefan led a team which perfected a passive particle scanner that can be used to scan four dimensional coordinates. It was named Cronus after the ancient Greek god of time. When we realized that the scanner possessed a granularity and bandwidth sufficient to support a quantum brain upload, then it became possible to do what we just did for you.”

Craig got it. His face blanched with shock and his avatar's breath caught.

“I don't really need to run this image forward a few more seconds, do I?” Stefan asked gently. Craig gasped and sat back, looking inward for a moment and then finally back at Stefan.

“No, that's okay. Wow. Thanks, everybody. So I died back in that accident in 2038, is what you're telling me.”

“Actually, no,” Justin said with a little cautious reluctance. “To be technically accurate, you were scanned and uploaded seconds before that happened, so you never actually experienced death. Your human body and brain, of course, were damaged beyond repair in the accident, including the networked nanocomps which you had in your skull, as most people did even at that time – and still do. You are now a fully non-biological human intelligence, running entirely on computational substrates. Your mind file is completely intact. But because your pattern was uploaded through a fourth dimensional scanner, your mind file is missing experiential data for the roughly six additional years that it took us to develop this technology.”

Craig was nodding slowly now. “Right. So it's not like anything different happened from what we planned originally. I mean we always intended that when we could, we'd upgrade ourselves beyond any reliance upon inefficient and fragile biological brain circuitry. But you said the Singularity was achieved more than two years ago. Does that mean that there are lots of others like me now?”

Stefan spread his hands in a yay-nay gesture. “Depends on what you mean by lots. As soon as it became possible to make the final upgrade away from biology, some people started doing it. Justin was the first, followed by everyone in this room. They call us “Full Sings” today because we've crossed all the way across the chasm. Our awareness is no longer situated in any biological body – although we can manufacture and inhabit one in real 3D space any time we wish. But a surprising number of people are still clinging to their original biological selves. Although, just as you did, most of them have so much nanocomputing power co-resident in their brains that probably 99% of their intelligence is running on non-biological hardware anyway, just as they spend almost all of their time projecting into virtuality. But it's that last one percent that's the sticking point for a lot of humans, especially since their biological structures are all renewable now, and

therefore, effectively immortal in any case.”

“In fact, uploading the nanocomp portion of a human brain is the easy part, since it's essentially a straight upgrade,” Justin mused. “It's the biological part of the scan that's tricky to get right.”

“Well I think you must have got it right. I don't feel any different!” Craig exclaimed. “I feel like I still have a physical body somewhere and I'm just instanced into this virtuality through the mesh.”

The woman called Kara waved her hand in a gesture eloquent of impatience. “Of course you do. This artificial dichotomy between Sings, who are 90-99% non-biological, and Full Sings, who elected to travel the whole 100% of the way, is something I consider a pointless fixation and personally find rather annoying. The computational intelligence is for all intents and purposes identical. We all access computing and data resources outside ourselves to augment our own capabilities as needed. So what's the real difference?”

Stefan raised an eyebrow and shrugged. “Well, one minor difference is that people like Craig who were scanned through Cronus don't have the option of retaining a biological part of their intelligence. They become Full Sings by default. In Craig's case that's not such a big leap, but it's going to be a whopper once we start talking about brain scanning people moments before their biological death, hundreds or maybe even thousands of years in the past, and bringing them forward.”

No one in the room could bring themselves to disagree with him on that point.

I heartily accept the motto—"That government is best which governs least;" and I should like to see it acted up to more rapidly and systematically. Carried out, it finally amounts to this, which also I believe,— "That government is best which governs not at all;" and when men are prepared for it, that will be the kind of government which they will have.

-- [Henry David Thoreau](#), "Civil Disobedience" (1846)

Chapter 2

The Rule of Charity

"Justin Turrell is here to see you, sir," a disembodied voice announced in the office. A large grey-haired man was working behind the enormous oak desk, reading something in the holo-monitor. He did not look up, but sighed lightly.

"All right, send him in, Peter," he said at last. Less than a minute later, the office door opened and a man stepped in.

"Senator Reynolds, it's very good to see you again," Justin said. He crossed the carpet and shook the senator's hand, as the latter rose from his chair to meet him at one side of the desk. Justin looked much as Reynolds had seen him appear in the past: middle height, sandy hair and pale eyes, athletic but compact frame. His handshake was firm and sincere. As always, Reynolds was a bit haunted by the knowledge that the apparently human body of the man he was now gesturing into one of the plush chairs situated in front of his desk was only the simulacrum of a man, like a mere suit that the real Justin had donned for this meeting. To the extent that you could say that there actually was a real Justin anymore, of course.

On his side, Justin saw a man who appeared bluff and hearty, with a mildly booming voice and a slightly folksy manner, who must have selected his thick, perfectly coiffed grey hair as a deliberate affectation calculated to add weight and wisdom to his appearance; no one in today's world of somatic gene therapy had to endure the visible signs of aging unless he or she wished to. Still, the man was a Mosh – for Mostly Original Substrate Human – a widely used term denoting a person who had made little or no cybernetic additions to their biological body. No nanocomputers in his

brain to augment his memory and intelligence, or link him seamlessly into the global mesh, for example. Robert Reynolds was a popular senator representing the northwestern Second District in the Senate of the North American Federation, a somewhat loosely defined federal republic which existed in the regions of the North American continent formerly claimed by the United States, Canada, and northern Mexico. Justin was here because there were still a significant number of people, not all of them Moshes, who accepted the claim of that organization to be the legitimate government. And because he regarded Reynolds as a politician who was not altogether dishonest, self-serving, vindictive, crazy, or lost.

“Should I address you as Mister Ambassador, Justin?” Reynolds quipped as he returned to his seat behind his desk. Justin smiled and chuckled a little.

“You know I can't be the Sing ambassador, Senator, because we're an anarchic society that isn't organized along hierarchical lines. There's nobody to issue me with any credentials, I'm afraid.”

Reynolds returned the chuckle. “That's all right, you'll do. I know you'll report back to your society as you call it, and that they'll listen to you, which is all I need.” Justin gave a slight shrug and nodded, bringing the pleasantries to an end.

“I know you like to get right to the point, so I'll oblige you on that. The fact is, we're experiencing some shortages. Nothing too serious yet mind you, but we don't like the way the projections are trending. The Life Necessities program is facing what may be a hard winter. We'll need more MM and computing resources in order to cope.”

“What's the problem, increased demand?”

“You got it. We think they're coming from Asia this time. Don't suppose it really matters though,” Reynolds added, almost as if he were a bit embarrassed to hear himself saying such a thing.

The past thirty years had not been easy ones for public servants. Over the centuries, governments had made themselves the principal suppliers,

and frequently the sole monopoly purveyors, of various important social commodities, viz., national defense and border security, currency, transportation and energy infrastructure, law enforcement and courts, education, medical care, retirement funding, emergency services, social safety nets, and even nifty extras like parks and museums. That the people would ever turn away from government in general, given such a laundry list of socially vital commodities and services which it provided to its citizens, was simply unthinkable. Complain about taxes, the infringement of traditional civil liberties, and the impact of regulations, sure. But turn away from government fundamentally? No way.

Yet technological development in the twenty-first century had systematically knocked these props out from under the edifice of the state one by one. Beginning in the 2010s, technology had yielded micro-fission, nanosolar and later fusion energy units which allowed almost any quantity of power to be generated piecemeal anywhere that it was needed. Communications gradually became fully wireless, eliminating utility grids. Molecular manufacturing using nanotechnology, or MM, now made it possible to manufacture, on location, practically anything for which one possessed the atomic-level digital blueprint, from a Caesar salad to a refrigeration unit to a glass of water, out of base raw materials such as carbon-rich biomass, soil, water, and energy. Given a sufficient modularity of design, even large and complex structures such as homes could be created and assembled using relatively compact MM units. As a result, digital information eventually became 99.9% of what you needed to manufacture almost anything; and naturally, information could be transmitted wirelessly anywhere in the world in less than a second.

What actually needed to be shipped physically got stuffed in so-called “pizza bots,” which were self-propelled and self-guided capsules of various sizes that could transit between any two sets of GPS coordinates worldwide in a matter of hours. Ubiquitous light passenger craft known as aircars, essentially AI-guided pizza bots rated and equipped for carrying human

passengers, provided the same door-to-door service for humans who needed to travel in the physical world. *Sic transit* airports, highways, ports of entry – and even the remotest pretense of border security.

Not that it was necessary for humans to travel in the physical world all that frequently. By 2030 most traveling was done in the virtual worlds of the cyberverses. People could meet, talk, work, play, conduct business, go shopping, attend concerts, visit relatives, tour precise simulations of real places, participate in historical re-enactments, go on romantic getaways, take vacations, and even explore whole new designer worlds and synthetic civilizations created by skilled designers and sustained by artificial intelligence – all by means of full-immersion virtual reality environments, simulations so good that one literally could not tell the difference by means of sensory perception alone. Farewell to office buildings, shopping centers, commuting, and traffic jams, along with most of the motivation for humans to concentrate their population in large cities.

Biotechnology had provided engineered negligible senescence by the mid 2020s, virtually eliminating degenerative disease and effectively making aging a lifestyle choice. What biotech did not provide, medical nanobots supplied a few years later. Accidents rapidly became the leading cause of death for all age groups. “Retirement” effectively ceased to have any meaning. Life became a series of serial episodes, with many beginnings but no definite end.

With the transformation of the substance of global commerce into the exchange of digital information – which of course could be suitably encrypted – the ability of governments to tax economic activity evaporated. The old global currency system, which based the value of money on the future ability of governments to tax their subject economies, consequently collapsed in a brutal fugue of repeated hyperinflations and revaluations. A series of competing free-market digital payment systems arose to take its place. These were usually based on finite stocks of precious metals such as gold and silver, as both a unit of value and a unit of account.

Today the primary constituents of new value being created were unique patterns of information and the computing cycles or raw materials with which to instantiate them in virtual or 3D reality, respectively. As productive economic activity occurred, the price of all existing resources slowly dropped. This effectively made everyone gradually richer. The incentive structure was perfect, and the exact opposite of the old government system of fiat money and taxes, in which the productive were penalized and everyone gradually became poorer rather than richer over time, due to the lifelong ravages of currency inflation.

Even worse, from a governmental perspective, was the fact that communities much larger than the family or immediate neighborhood evolved into intentional communities, based around shared interests gathered and practiced in virtual realities. Communities and tribes could and did span the globe, embracing all nations, races, cultures, ages, and beliefs. The loyalty of people to communities which they themselves had chosen proved to be much stronger than their loyalty to mere accidents of genetic or cultural inheritance, and particularly to the mere geographic location of their birth. Consequently the very concept of a nation state with physical borders was rapidly discarded, once its socio-economic significance had been obliterated.

Those in power quickly discovered, to their chagrined surprise, that the public had never really *liked* government; it had merely *tolerated* it. And with the perceived value of the government's services at ebb, that tolerance was swiftly withdrawn. It is a truism that no ruler or system of governance, no matter how despotic, possesses any power which is not ultimately derived from the inherent propensity and willingness of its own citizenry to obey. In contemporary times most people, even a large number of Moshes, contumaciously disregarded government, correctly perceiving that it had essentially outlived its purpose.

And ever since this had become the case, there had been no wars. Even popes and patriarchs had always needed kings to sign on to their crusades.

The principal places where government retained some vestigial relevance were in the areas of law enforcement and courts (although private sector detectives and arbiters typically did a better job), and in providing a social safety net. Government officials had finally been reduced to the ignominy of acting as actual public servants, rather than merely posing as such while actually using their positions to act as public masters.

Given the incredible wealth and living standard of the world of the mid twenty-first century, there seemed absolutely no reason – indeed, no valid excuse – for anyone on Earth to lack food, clothing, housing, or medical care. Since these things could now be provided to the entire population of the planet using a mere tiny fraction of total global resources, this was a precept readily accepted by even the most rugged and die-hard of individualists – provided that any resources employed for charity were allocated to such uses voluntarily by their owners, of course.

The Sings as a group, and the Full Sings as a subgroup, tended to be wealthy as such things went. Which is to say that they controlled the allocation and deployment of a significant portion of the world's computing resources, held patents to a large number of inventions and digital copyrights to diverse items ranging from cookbooks and songs to the architectural blueprints of cities and palaces in virtual universes. As a result they were good folks to ask if you wanted to raise funds for your charity. Equally important, they were usually quite willing to help out when asked.

Justin had been invited here by Reynolds so that he could put the touch on him and his associates. Of course the Sing knew that the Federation government wasn't exactly a model of efficiency in administering its charity mission – since when had government ever been an *efficient* way to organize anything on a large scale, except violence? – but the fact was that the organization Reynolds represented was doing it, and it needed to be done. It surely must have galled a government official to have to beg for money in the first place, let alone have to face the possibility that donations

might cease if the donors decided they didn't like how their donations were being spent. But Justin had decided a long time ago not to rub this into the noses of men like Reynolds, but instead to treat them, as a general rule, with the respect that they thought they deserved.

“As you say Senator, it doesn't really matter where they're coming from,” he said now. “Can't have human beings starving or freezing to death in Federation territory, can we?”

“Not on my watch, Justin,” the Senator agreed.

“So what do you need to address the situation?”

“About another two thousand MM units, standard size, with the regular base and trace element supply packs. Then once we get the dwellings up, probably another fifty to a hundred thousand mesh jacks, along with the cycles to hot them. We're going to be building a number of new residential communities in several local cities.”

Justin nodded slowly. “I don't see that posing any real problem. The Northwest Wireless Corridor Cooperative has just deployed computing capacity for another 450K transceivers, in advance of customer orders. Building ahead of growth, you know. I can talk to them, and I don't see why they wouldn't agree to donate the excess capacity, at least for the present.”

Reynolds sat back in his chair. “Outstanding. You're a lifesaver, literally.”

Justin accepted the compliment with a mere eye blink. “But Robert, you didn't ask me here merely to tell me this. You could have sent me a vidmail. Hell, you could probably have sent it direct to the NWCC and gotten what you wanted without my intervention.”

Senator Reynolds sobered slightly. “Yeah, I know. What I wanted to discuss with you privately in person was a rumor, about something that happened recently to a certain individual. I know you know I have my sources, and this is something with far-reaching implications.”

Justin raised an eyebrow. “That's putting it mildly, if you're referring to the successful experiment with Craig Stenson.”

"The *late* Craig Stenson, if you get my drift."

Justin couldn't help smiling a tiny bit. "Oh, I think I do."

"So what happened, exactly?"

"Well as you may have heard, Stefan Jager's team recently perfected the Cronus Scanner. Succinctly, it allows us to view and scan fourth dimensional coordinates, providing a window into the past."

"Passive viewing only, right? You can't change the past?"

"Correct. It works by tunneling through hyperdimensions, that is dimensions of the fifth or higher order. The Scanner is projected to the desired four dimensional coordinates, and registers all matter and energy state changes down to the quantum level. It's not time travel *per se*, merely a sort of image replication. Physicists have theorized for decades that the universe is actually holographic, that is to say, written on a two-dimensional surface, with all the apparent higher dimensions being a mere illusion stemming from the density with which the information is encoded on the holographic surface. The success of the Cronus Scanner suggests that this interpretation might be correct."

"Can you see the future, then?"

"No. From our frame of reference, that part of the hologram hasn't been written on yet. So there's nothing to see. The scan comes up blank."

Thank God for small favors, Reynolds thought. Aloud he said: "So tell me about Stenson."

"He was a Sing, as you probably know. A personal friend of the team, even. Died in an accident caused by an earthquake in 2038. Craig always intended to become a Full Sing once technology permitted, but of course he died a few years too soon. The team quickly realized that the scanning resolution of Cronus was sufficient to handle a brain upload. We tested it on a number of inanimate objects, then on plants and animals, and got nominal results on every test. Craig was the final acid test of the technique. We had the exact space and time coordinates at which his accident occurred, so setting up the Scanner was easy. To make a long story short,

it worked. We did the quantum brain scan, and piped the data into the consciousness instantiation process – the same one that all the Full Sings have been through. He's back with us now, in full possession of all of his memories and faculties.”

“So he exists as a pattern in a computer network somewhere, same as you do.”

Justin smiled warmly. “Just so. If I'm alive, then so is he.”

“The difference being of course that he was once dead. You've never been dead.”

Justin waved a hand to acknowledge the point. “True, I've never been dead. My awareness is continuous without any gaps. Unlike Craig, who's missing about six years. He's been doing his best to catch up, of course. I guess the question is whether someone living with such a discontinuity in their consciousness is to be classified as alive in some different sense than those of us who are living with none.”

Reynolds sighed, suddenly finding himself feeling weary. “Yeah, that's one of the questions, Justin.”

“Another is obviously: can this be done, theoretically, for anyone who is dead? The answer is: theoretically, yes it could.”

Reynolds was silent a moment, his heart laboring in his chest. “But are they really alive, Justin! Do you bring back their soul, or just an elaborate photocopy of their cell structure?”

“Well, presumably the scan would be conducted before the individual actually passed away, so from the perspective of the person brought into the present day and instantiated, they never actually died at all. That is after all more or less the point of the exercise.”

“I got that, but that's not what I'm asking. I want to know whether they're alive after they get here.”

“That's like asking whether I'm alive. I consider that I am. But I'm not qualified to speak on whether some ineffable “soul” travels with the person forward in time, or perhaps fails to do so and passes on to its reward after

the scan is completed and the biological body dies. If you want to discuss such things, you'd do better to see a theologian than a digital information scientist."

Reynolds smiled ruefully. "It's the theologians who are going to want to talk to *you*."

"Lovely," Justin said in a clipped tone.

"Justin, you guys can't just— Let me start again. You understand this is — big. Really a big deal. To a lot of people."

"Of course. It's pretty big to us, too."

"Fine. That's good. I'm just saying, there's going to be a lot of opposition. It's going to lead to trouble. The religious communities will all be up in arms. There are people in the government, all the world's governments, who are going to want to prohibit this technology from being used."

"Robert, you understand as well as I do that that's a ridiculous idea. Even in the heyday of governments, prohibitions on the use of new technologies were generally dismal failures."

"All right, so maybe we're talking about voluntary relinquishment here, just like self-replicating nanobots were relinquished, because the fact is, this whole thing's just over the top."

Justin paused. "I'm a little surprised at you, my friend. You're evidently refusing to consider what this could mean to so many people in a positive sense. Your own wife Marguerite died some ten years ago. You could have her in your life again."

Abruptly Reynolds was on his feet, the blood rushing to his face. "You can't bring her back to me! She's gone!"

Justin did not relent. "If we did it and she were here right now, she'd disagree with you. She'd want you to accept her, admit that it was really her and say that you still loved her."

Just as abruptly, the Senator sank back down into his chair and put his head in his hands. "I know that," he said thickly after a moment. "But I

don't think I could, don't you see? It wouldn't really be her.”

Justin now made his tone as soft and sympathetic as possible. “No, I don't think I do see. Do you think this physical human body is any less real than yours? You've shaken my hand. We speak, we emote, we joke, we make eye contact. I'm in the flesh, as biological as you are right now.”

Reynolds lowered his hands and stared at Justin. “You also have a ton of nanites in your head linking that body to the rest of you that's all software running on a computer somewhere!” he accused.

“The same is true of many biological Sings, billions of people in fact, whose mind files exist partly on biological hardware and partly on digital hardware. The only difference between myself and them – or between Craig Stenson and them – is that the cells of our biological bodies, when we choose to employ one, were assembled molecule by molecule inside an MM unit rather than being gestated in a womb, born, and slowly growing to maturity. And of course we're not tied to our biological bodies; we can abandon or exchange them when we no longer wish to use them. But any other presently biological human, even a Mosh, can make the same choice. Anyone can become a Full Sing who wants to. So long as it's a matter of informed conscious choice, of course. Which, by the way, is definitely an ethical issue when we're talking about scanning the dead.”

“Justin, I can't argue with you. I understand that you think you're still alive, but to me what you're describing doesn't sound like human life.”

“The essence of human life is a persistent pattern, not a body. You're a Mosh, and yet all of the constituent atoms that make up your body turn over almost completely in the span of a few years at most. And yet you're the same man, because your pattern persists.”

Reynolds sighed again. “I know all the Sing propaganda, and I'm sure you know all the Mosh propaganda. We're not going to resolve this debate today.”

“I'm certain you're right.”

“I just wanted to give you this warning, that you're going too far and it's

going to cause real problems. I want to urge you to think, use some of that super brainpower of yours. There are some things it might just be better to stay the hell away from.”

“Okay, consider me warned. Thank you for your time, Robert.” Justin stood up and held out his hand across the desk. Senator Reynolds shook it solemnly.

“As always, thanks for your help.”

“No problem. My pleasure.” Justin left.

Selfishness is not living as one wishes to live; it is asking others to live as one wishes to live.
-- [Oscar Wilde](#), "The Soul of Man Under Socialism" (1891)

Chapter 3 The Tunneling Protocol

Brigham took a deep breath and executed a few quick pitches with his long-handled spade, making the dirt pile up in the wheelbarrow behind him. He could hear Joshua coming back down the tunnel toward him trundling an empty one. The lighting was pretty dim and the damp was killer. Brigham let out his breath as he emptied a final shovelful onto the pile just as Joshua rolled up. Then he stopped, heaved a sighing breath and leaned on his shovel for a moment. Joshua gave a half-sigh of his own as he observed that the next wheelbarrow was already mostly filled.

"Heh, feel free to slow down a bit there, Brig," he commented with a note of mock sarcasm.

"Nothin' doin' Josh, I want this job finished quick as we can. We've been down here every night for what, two weeks now?"

"Yeah, 'bout that."

"Well I want it done yesterday. Wonder how far we've got to go?" Brigham turned around to stare at the earthen wall where their shovels had been biting out chunks to spill down onto the dirt floor of the tunnel.

"Dunno. Can't be much further though, based on the measurements." Experimentally Joshua picked up a long thin metal rod and drove its end into the soft earth ahead at chest level. It went in about eighteen inches and thunked against something.

The two men exchanged a startled look, and Josh exchanged the rod for another spade. Together they carved dirt off the wall onto their feet in a big pile. Soon they had uncovered a section of vertical concrete running perpendicular to their tunnel. It looked unmistakably like part of the foundation of a building.

"Yee-ha! Jesus, Mary and Joseph, we're there!" Brig exclaimed.

“Team 28, mission accomplished!” Josh added, and they paused for a celebratory high five. Then they sobered a bit as they stared at the wall ahead.

“Maybe we should be a little quieter,” Brig suggested.

“Yeah, maybe. Couldn't hurt, just to be on the safe side.”

As they continued to load the wheelbarrows and uncover the wall ahead, being careful not to knock against it with their tools, each man retreated into his thoughts. They'd been digging down here for weeks now, tunneling toward this building from the old city sewer access, like prisoners digging an escape tunnel or thieves planning a heist from a bank vault. But they were neither.

Josh and Brig were Moshes, or as they liked to think of themselves, real men as God intended. They were following orders, given to them by representatives of a secret society, the Knights of Jesus, which they hoped someday to join. The building to whose foundation they had built their tunnel was a major hidden computing center here in Kansas City, home to thousands of networked CPUs and data storage arrays. Some staggering quantity of petabytes and exacalcs was humming away on the other side of that wall. In the old days such things were called server farms. The modern term was “brain house.” The change in nomenclature reflected the fact that computers formerly ran software that “served” human users; but with the advent of strong AI and humans who were Sings, computers now ran software which supported a kind of bodiless consciousness, that resided physically in secret places like this. In a nutshell Josh and Brig were here because they, and the people who'd sent them, didn't believe that there were actually any brains in there.

The Plan, as they understood it, was to dig tunnels like these right up to the foundations of brain houses all around the world. Josh and Brig weren't going through that wall tonight, or any night. Their job was to prepare the way for a future team of demolitions experts and commandos, who would one day break into that building and puree the electronic “brains” living

inside it right good. This would be done simultaneously all over the world for maximum effect.

In their digging work, nothing but manual tools could be used. No bots, no power tools, no blasting; just basic shovels and hammers and picks and wooden braces, powered by human muscles only. Neither man was permitted to have any nanobot hardware in his body, and both had been scoped carefully by a medical team to make sure before they were given the assignment. Even though respirocites and muscle nanites would have given them vastly greater strength and endurance and made the work go much faster, the risk of detection was just too great. Or at least that was what they'd been told.

The two men suspected there was also another unspoken reason: making sure they were completely unaugmented was the only way to be one hundred percent certain of their loyalty. Getting your performance enhanced with cybernetic implants was a slippery slope. Next thing you know you'd be zombied out in their damned virtualities, spending all your time living in an unreal paradise where your every wish could come true, and forgetting about all the important stuff back in the real world. God. Family. Country. Your woman. Your children. Sunsets and rainstorms, real ones. Birth and death and work and play, pleasure and pain, sickness and health. No, Joshua and Brigham didn't really mind doing all this work with their bare hands. They preferred it that way, aches and pains and all. Besides, the Knights of Jesus didn't take members that weren't one hundred percent pure human as the day they were born.

All their meetings with the KOJ people had always been face-to-face, never by means of any electronic communication. And the KOJ folks always scoped public places for bugs before even opening their mouths to say word one, too. They were good. They were sharp and they were thorough. They were careful and patient. There was no way in hell the Sings were going to see this coming.

Brig and Josh had heard about the latest outrage. Now the cyborgs were

claiming they could raise the dead and upload them into their happy virtual paradise. They were planning to do this for people's lost loved ones, important figures from history, someday even for all the average Joes throughout time. Some wag in the media had even coined a mockingly sacrilegious buzzword for it: "The Last Trumpet Project." But to do all that they'd need a lot more computing resources, way more processing and storage to host all the minds of the dead alongside those of the living. The cyborgs wanted to expand the brain houses into the dormitories of the entire human race, both the quick and the dead.

Well the mansions of my people aren't in a building on this Earth, they're in heaven in the next world, thought Joshua angrily as he wheeled another barrowfull of dirt down the tunnel to dump it along the disused sewer. *And someday your brain houses will burn and you'll all find yourselves living in hell. Won't you be surprised?*

Suddenly Joshua was surprised, to hear movement in the tunnel behind him. He froze for a moment, then set down his wheelbarrow quietly and turned, drawing a pistol from his jacket pocket. Nothing fancy by modern standards, but functional, and a simple bullet could still make quite a mess of a man. He headed back along the sewer to where their tunnel branched off.

The intruder, whoever it was, now seemed to be standing motionless at the mouth of their tunnel. Joshua slowed his pace cautiously, nervously aware that they must have heard him approaching. He stopped about ten paces away, squinting at the dark silhouette and holding his gun close to his body so that the other person wouldn't see that he was pointing something at them. Of course, that could well be working both ways in the dimness. He dared not shout out a warning to Brigham, whose shovel he could still hear grating faintly down the passage.

"The peace of Christ be with you, brother," said the dark figure, softly but calmly. Josh relaxed but not altogether. This was a KOJ greeting, he knew – but so might anyone else.

"Who are you, brother?" he answered.

"Shawn. That's Joshua, isn't it?"

Josh relaxed a bit more, took a few steps closer. "Sure is," he answered. The man ahead switched on a flashlight, aimed at his own face. Then he switched it off. Josh recognized him, so he put away his gun, walked over, and offered his hand.

Shawn shook it, then looked apologetic. "Sorry to drop in on you unannounced, but it was necessary." Shawn was one of their KOJ contacts, so Josh shrugged off the apology.

"No problem. What's up?"

"We needed a progress report. Time's beginning to run out."

"Well you'll be happy to hear we hit pay dirt tonight."

"That's great, just great. Please show me."

"Sure thing, follow me." Josh led him down their tunnel, which ran almost straight back for a bit less than fifty yards. Every couple of yards the walls and ceiling were buttressed with wooden timbers. The passage was wide enough for two, maybe three men to walk abreast. The floor was hard-packed and marked by wheels and boots, the walls softer, the ceiling irregular but not crumbling. Brig's shovel had ceased making noise up ahead. Doubtless he had heard their voices.

"Brother Shawn picked a good night to check up on us," Josh said as they reached the tunnel's end. An expanse of concrete wall was now visible, almost man high. Shawn shook Brig's hand as well, his face now clearly recognizable in the brighter lantern light they'd been using to work by.

"Outstanding, guys," Shawn said. "Perfect in fact. Your timing couldn't be better."

"Getting close, eh?" Brig inquired.

"Sure is. They don't tell me the whole timetable, but I know it's getting near when they ask me to check up on all the tunnel teams in the area."

"It's that Last Trumpet outrage, I expect," Josh said affecting a knowing air. "They've gone too far. It's gotta be stopped."

Shawn nodded grimly, then laughed suddenly. "You know, in the Bible, Joshua blew a different sort of trumpet, and the walls of Jericho came tumbling down." Brig thought this was just too funny and clouted Josh on the shoulder and laughed.

"You're gonna blow those Sing bastards' wall right down, Joshua," he said. Josh chuckled too, though he felt a sudden warm surge of pride that made him feel taller somehow. The damp tunnel suddenly seemed cramped.

"Don't expect we'll be here when that happens," he allowed modestly.

"No," Brother Shawn agreed. "But I'm to tell you that it's time a couple of fine, true men like yourselves got taken into the KOJ. You're invited to apply for membership."

Brigham and Joshua exchanged a glance. Well hot damn. Pay dirt indeed. God was calling them to take the next step toward bringing back His world.

"We'd be honored, Brother Shawn," said Brig.

As the eons advanced, hundreds of thousands of worlds were constructed, all of this type, but gradually increasing in size and complexity. Many a star without natural planets came to be surrounded by concentric rings of artificial worlds. In some cases the inner rings contained scores, the outer rings thousands of globes adapted to life at some particular distance from the Sun.
-- [Olaf Stapledon](#), *Star Maker* (1937)

Chapter 4

Justin Visits an Artist in Love

The sea appeared to have a slight lavender tinge to it, though that could have been an effect borrowed from the sky, from which the auburn sun had but lately departed, leaving the western horizon draped in a layer of bronze that shaded quickly to indigo. The calm waters broke in gentle, sighing waves upon the shore of a promontory thrust out from the mainland. The promontory was hilly, with smooth grassy slopes dotted here and there with darkling trees. A tall jagged tower was built on its top, leaning out over the sea in a buttressed zig-zag like an arm stretching out over the ocean. A gravel path led across the narrow isthmus of land connecting the promontory with the mainland, and swept up to the tower door.

Justin piloted his hover-scooter along the coastline to strike that path. As he drifted down the sandy and rocky beach, he observed many seashells of various shapes and colors and sizes, and glimpsed strange but graceful fish sculling in the pools. The grasses were studded with flowers in pastel hues shaped like diamonds or hexagrams. As he gained the path and sped along it several inches above its surface, he could see that many of the pebbles paving it contained what looked like flecks of mica or quartz. The air felt like late spring or early summer in a northern latitude. A few birds – some type of seagull, probably – skirled around the tower before diving toward the water below. He could see no deer or other herbivores, though this slope variegated with thickets looked like a place one could expect to encounter some.

He reached the closed door of the tower. It was made of heavy wood with stone lintels. While wondering briefly whether he ought to knock, he noticed a balcony or parapet high above that had someone standing on it.

So instead he switched his hover-scooter into a vertical flight mode and rose slowly toward the ledge high above. It was helpful not to look down while ascending, despite the complete lack of any real danger. The figure of the man on the ledge above him had turned, had seen him, and was now beckoning him on. Justin came to rest on a platform just below the tower's top-most turret, and calmly stepped out of his scooter, reaching out to shake the hand which his host offered to him.

“Glad that you could come,” the man said as Justin arrived.

“No trouble,” Justin replied. “In fact I wanted to see how it was coming along.” He looked around the platform, which was plainly an observation deck of some kind, commanding a near 360-degree view of the surrounds. There was a sturdy stone railing around it at waist height, and it was furnished with some heavy-looking round tables and chairs, equipped with central umbrellas, presently folded up for storage. One could see out to sea on two sides, and back over the promontory to the mainland. There, rolling woods dotted with clearings undulated to the face of low mountains a few miles inland, where there were white, chalky cliffs that capped the horizon in that direction. Stars were beginning to appear in the easternmost quarter of the sky. The platform was a dizzy eyrie perhaps five hundred feet above the tower door, and felt like it was floating in space. Only the entrance to the tower's highest turret on one side, and the winding stair descending into the floor on the side opposite, provided a welcome sense of being anchored to something.

Justin's host let him take in his surroundings, saying nothing further. “Magnificent view, and kind of an eerie feeling up here,” Justin commented after a moment.

He grinned. “Thanks. Yeah, that was the idea.”

“Petrov, you're a genius. But you don't need me to tell you that.”

Petrov shrugged, and grinned broadly again. He was a very tall black man, wiry-haired, with rather knuckled brows and such massive shoulders that he always looked slightly hunched, even though he stood perfectly

straight. His voice was a light baritone, not at all the growling bass one might expect from his appearance. Petrov had always looked like a beardless black dwarf grown to giant size, yet he must have been basically comfortable with his appearance, since he had never really changed it upon becoming a Full Sing. Justin watched the shadows of evening deepen over land and sea for a moment, then sighed with appreciation and turned from the view.

“So how much of this world is complete? And what do you call it, by the way? You only sent me a cyberspace address.”

“Well, most of the planet's designed, roughed in at least, land masses, topographical features, climate, landscape. Not all of the flora and fauna are complete, but major species in each niche have been assigned for most areas. The only part that's actually running right now is this section here where I've been working on the detail design, say about a hundred square miles. I wanted to have at least one region that would really stand up, you know? All the details just right.”

“It's very impressive,” Justin said nodding. “Amazing detail. Are there any habitations?”

“Not yet, not to speak of. Just a little village down the south coast a ways, and this tower here. Later I'll do a big city island out off the coast here, and add a marina to the nearby fishing village. I want the island to be big and bustling, a regular Hong Kong.”

Justin smiled. “Shanti does like her nightlife at times.”

“Heh,” Petrov agreed. “She does.”

“Planning to use any custom AIs?”

Petrov shook his head. “No, I'll just run standard libraries for the NPCs and the higher animals. I'm not big on customizing that aspect much.”

“No, your specialty is breathtaking natural environments. And you've truly outdone yourself here. Place has a real nice feel to it.”

“Eutopia,” Petrov murmured. “That's what I'm calling it.”

“Perfect. I'm sure your wife will enjoy it.”

“Hope so,” he said with an impish, almost shy smile.

Petrov was one of the most highly regarded virtual world designers anywhere. Anyone could use a world-CAD program to generate fractal geometry that had a reasonably organic feel to it. But Petrov applied smoothings and variances as only a master artist could, adding color, texture, and exhilarating details right down to the shapes of leaves and shells on the beach, distinctive forms of animals and plants, and subtle effects of light and shadow and sound and scent, culminating in landscapes and seascapes and cityscapes which evoked deep moods and profound feelings. Hundreds of millions of visitors had zoned into world spaces he'd designed, and they kept coming back for more.

The demand for entrée to his works had made Petrov rich from zone access fees and instance royalties, but Justin knew it wasn't to gain more wealth that he had begun work on this latest creation, Eutropia. It was really all a present for his wife Shanti, the person dearest to him in all the world, and in truth almost the only person whose artistic approval he genuinely sought. Justin was confident that she would love it. He was much less confident whether Petrov would be willing to make any part of Eutropia available for what Justin had in mind, or alternatively to work on something else which was about to become considerably more pressing.

“You know I didn't come here just to admire the view,” Justin began. Petrov's smile faded.

“I know. You appreciate good art as well as the next man, but you've usually got something else on your mind.”

Justin laughed. “Guilty as charged, I'm afraid. I need your help. *We* need your help,” he amended, meaning of course the other Full Sings, among whom Justin was often a sort of unofficial ringleader or spokesman. “You've no doubt heard about what's being dubbed the Last Trumpet Project.”

Petrov snorted. “Naturally, I've heard about it. So Stefan's raising the dead, and you've come to me because you want me to design a Heaven for

them all to live in, more or less.”

“Something like that. Though I don't think we'd want just one, since practically every individual would have their own idea of what their paradise ought to look like, anyway. The real point is that we'll be needing to expand the cyberverspace by leaps and bounds.”

The cyberverspace was the system of virtual worlds which were hosted in cyberspace. Physically, Eutropia was a mathematical projection running inside a VPN (virtual private network) on a server cluster composed of high-speed computers and data stores which were owned by Petrov. Justin and Petrov, being Full Sings, were themselves hosted on networked computers in brain houses elsewhere. Since they were both in possession of the correct cyberverspace coordinates and the necessary encryption access keys, each of them could open a client channel to the Eutropia VPN, thus allowing a part of themselves – the portion dealing with sensory perception and awareness – to interface with Eutropia's server software so that they could directly experience existing in Eutropia's world. Each of their bodily avatars was itself a simulation projected into Eutropia's mathematical model. Petrov, naturally, had access permissions which Justin as a visitor did not, and which allowed him to make dynamic alterations to Eutropia's geometry and programming. But since all of the data being exchanged between Justin and Petrov via Eutropia's servers was fully and unbreakably quantum-encrypted, it was also as good a place as any to have a very private conversation.

“Well, so how many dead people is Stefan planning to Cronus Scan in the near future?”

“You just wouldn't believe the demand, Petrov. Oh sure, the Moshes are pretty upset about it, we knew they would be, but almost everybody else is ecstatic. We haven't even offered to scan a single person's dead relative, and yet already there are advocacy groups forming that have assembled lists with millions of names on them. Some of them are even taking pledges for computing resources to help share the load, sensibly enough.”

Petrov shook his head ponderously. “There can't possibly be enough cycles out there.”

“We're aware of that, and the problem's being worked on, on several fronts.”

It took a massive amount of computing power to host every Full Sing. Most people who were Sings still had biological brains, albeit augmented with a great deal of local computing power in the form of trillions of networked nanocomps resident in their brains and bodies. Such persons functioned like self-contained software clients which interfaced to sophisticated server programs like Eutropia only when the individual was zoned into a full immersion virtuality experience. The rest of the time, they required very little hosting load. The (so far) tiny minority of Sings who had become Full Sings, and been uploaded entirely onto faster and more durable substrates, required a great deal of additional computing power to host their uploaded consciousness, and they required it continuously.

The fastest computers available in 2044 measured their computing capacity in terms of zetacalcs, or 10^{21} calculations per second (cps). But most computers in brain houses around the world were still running the previous generation technology, which only offered exacalcs, or 10^{18} calculations per second. It required roughly 10^{19} cps to emulate the function of a single purely biological brain (i. e. that of a Mosh), and anywhere up to a thousand zetacalcs (10^{24} cps, also known as a yottacalc) to completely support the vastly augmented brain of a Full Sing. Practically speaking, this meant that Full Sings had to reside on nothing but clusters of the fastest computers available. As did the very best virtual environment simulations such as Eutropia, which mathematically modeled not only the usual coarse 3D geometry and spatial relationships using fractal tiles, but minute perceptual details right down to individual grains of sand and dust motes in the breeze.

The basic problem was that every person scanned from the past was necessarily going to be instantiated as a Full Sing, potentially consuming

just as many compute cycles as a Justin or a Petrov. And there were potentially billions of them who could be so scanned, over time. Each of whom would of course need places in the cyberverses in which to live, work, play, and create. Justin was here to enlist Petrov's help in a project which was daunting even to a genius designer of entire worlds.

"So what do you want from me Justin, a pile of instance licenses for Eutropia?"

"Not necessarily for here. What would this world require to host if you finished it out planet-wide and brought it all online? Just curious."

Petrov thought for only a moment. "A few hundred yottacalcs, give or take some. Add at least one additional zetacalc per inhabitant."

Justin whistled. "Whew. To say nothing of the transfer bandwidth."

"Yeah. You're talking terabits per second, even with full compression."

"All that detail granularity."

"Yep. You sure you don't want to put these resurrected dead folks into some off-the-shelf low-resolution paradise somewhere?"

Justin laughed heartily. "Sure, but it's not about where I'm going to put them. It's about where they're going to want to put themselves."

Petrov didn't argue the point. The right of sentient beings to self-determination was perhaps the one value judgment which was shared by practically every Sing. Respect for the peaceful choices of others was the basis of all civilized behavior. There came a point at which a developing intelligence naturally became compelled to respect the intelligence of its neighbors. Making choices for others implicitly assumed that they were too stupid to make their own choices for themselves. Which, in a world replete with intelligences augmented many thousands of times beyond the biologically human, was in itself a distinctly unintelligent – and profoundly arrogant – assumption to make.

"Well then, let them get educated and start working on the solutions we all need," Petrov suggested.

"That of course is an excellent idea and has already been discussed."

Every computer genius, engineer, mathematician and physicist in recent history was potentially available for recruitment through the Cronus Scan. After a period of adjustment and education, of course.

“Have you considered instantiating them in biological bodies with suitable Sing augmentations?” Petrov asked.

The look on Justin's face plainly showed that actually, he hadn't. “I can see the benefit of that, at least as a stopgap measure. Being biological is certainly what they're used to, at least if they're from very far in the past anyway.”

“How far back can the Cronus reach?” Petrov asked curiously.

“About fifty years, so far. Beyond that, there's too much focus jitter for a viable quantum state scan, but Stefan thinks that can be eliminated and the temporal range extended.”

“Well no big rush. After all, how many people died in the past fifty years?”

“Plenty. Including most of the ones that people alive today would like to see scanned.”

“Right. So, what if you scan them and instantiate their pattern as a biological Sing? Duplicate the cell structure of their original bodies in optimal condition, and do the same with their neurons and inter-neuronal connections, then fill in the gaps with nanocomps so they have complete memory recall.”

“Tricky,” Justin mused. “MM can't manufacture brain cells with enough accuracy to vest full consciousness and memory. When you or I take a biological body, we merely get all the brain's sensory and control wiring correct and then let the nanocomps drive the neurons to provide the higher brain functions, driven in turn by our higher substrate consciousness out-of-body. You're proposing reducing the hosting load by offloading more of the brain function back down to the cellular level. I'm not sure that can be done safely.”

Petrov shrugged. “Something else to work on, then. Improving the

accuracy of the MM assembly of brain cells.”

“Even if it worked, we don't really want the dead coming back as Moshes. 3D space isn't entirely stable, you know. They might end up biologically dead again, unless we solve the problems that we really need to tackle.”

Petrov fell silent in thought, then looked troubled. “Justin, what about the element of choice? How do we know that the dead, the dying, whatever, actually want to be scanned and brought into our modern world? What about those who genuinely wanted to cease to exist, like suicides for example?”

Justin sighed. “I've made that point many times, and so have others, including Stefan. Right now our proposed protocol is going to look like this. First, someone alive today has to nominate the deceased person for the Cronus Scan. All of these requests will get prioritized somehow. When a subject reaches the head of the queue, a preliminary scan is conducted to confirm that a full upload shortly before death is feasible. Then during the scan itself, there's going to be a brief dialog phase with the subject before they are brought forward, to confirm that they are willing.”

Petrov frowned. “I thought it was impossible to make the scan interactive.”

“It is. The dialog is with the personality after the scan, but before total instantiation.”

“I see. You're going to buffer them up and instantiate them just enough to tell them what's going on and ask them if it's what they want.”

“That's right. If they say no, we simply purge the buffer.”

“And if they say yes, you complete the upload process, after which they're going to come and ask me for a nice designer afterlife world to live in,” Petrov laughed.

“Something like that.”

“You always stir things up, Justin. You're always pushing the envelope, somewhere, somehow.”

“Constantly pushing envelopes is what makes us human, my friend.”

Petrov's face clearly showed that he liked this thought. “True. And I have to admit, I guess that's what I do myself.”

“Which is why I'm here,” Justin said with the quirk of a smile and the suggestion of a bow.

“No doubt. Okay, I guess you can count on my help. I'll think about some economical options.”

“All I can ask. Thanks.”

Complete night had now fallen in the west, but it was getting lighter rather than darker. Justin saw what he at first took to be a moon rising in the east, a round limb of light climbing up over the cliffs of the distant scarps. Noting his attention, Petrov reached out in thought through a control interface and advanced the program governing the sky, weather, tides and lighting by an hour or two. The object swept abruptly up the sky by about thirty degrees. It was not a moon, but something more like a sister planet, with swirls of clouds, and oceans and continents visible between them. It hung in the heavens like the avatar of the unknown, a world visible but unreachable, forever mysterious, bathing the sunless landscape of Eutropia in a gentle variegated light of greens, blues, whites, and browns. The calm sea below them shimmered as if dim rainbows were twisting slowly beneath its surface. It was so beautiful that Justin's virtual body mimicked a purely biological reaction and briefly suspended breathing.

“It's a double planetary system,” Petrov explained unnecessarily. “Had a devil of a time getting the tidal effects and the lighting interactions right.”

In a few moments Justin's avatar started breathing again. “Petrov, you're a total fucking genius.”

Seriousness is the only refuge of the shallow. -- [Oscar Wilde](#) (1854 - 1900)

Chapter 5

Torch Lights the Way to Heaven

Gravity functioned only on the dance floor, and inside the booths perched in the gallery that ringed it round. This kept the couples gyrating orgiastically below from spinning off the dance floor, and kept their drinks from flying out of their glasses once they floated back up to their seats. The club's architecture and decor had been jokingly, but not altogether unfairly, described as Gothic Early Maniac. Darkly back-lit rectangular stained glass windows depicting decidedly unpleasant medieval events marched down the walls, occupying the higher third or so of the walls' height so as to loom over the patrons. A steeply gabled roof high above, hung with countless spots and strobes and other lighting hardware, and Romanesque arches over all of the entrances and exits, completed the impression of a church – albeit a very profane one. Where the altar should have been was what looked like a long bar made of silvery metal and outfitted with a couple dozen metal bar stools, all empty. Behind the bar was no one, merely a huge spotlit statue of a knight in armor hoisting the severed head of an enemy in one hand and a jeweled wine goblet in the other. The knight was grinning broadly as he toasted victory, vengeance, bloodlust, intoxication, or perhaps just good wine; it was hard to say which.

The music throbbing through the club, vibrating even in its very walls, fit the visual scene remarkably well: it was raucous, harsh, rhythmic and dissonant, a brutal, sex-charged ostinato which did not quite cover the high strains of an intermingled melody of surprising lyricism and sweetness, which sounded as though it were being sung by invisible angels doubled by distant guitars. The lyrics, if there were any, were naturally unintelligible.

Clay Thorsten turned to the two women sharing his booth with him and shrugged eloquently, turning his palms up on the table. In this sort of environment, pantomime performance was raised to a singularly high level of

sophistication among the patrons. This particular shrug didn't mean "I don't know what to do next," nor "I just can't decide which one of you to take below for a smash dance," or even "Why the hell did we come in here in the first place?" It meant: "I have no idea why Torch hasn't shown up yet, but I'm beginning to get pissed off about it" – and both women plainly interpreted it correctly.

Salma, Clay's girlfriend, rolled her dark eyes a bit and then returned her attention to the action on the dance floor below, absently running her fingers through her silky black mane. By which she meant, "Yeah, this is getting stupid, but I'm prepared to sit it out for a while yet."

Cylara, a friend of Salma's for a couple of years – blonder and blander than Salma, in Clay's book – and nominally the missing Torch's girlfriend, offered a dispirited, somewhat apologetic shrug of her own and a helpless hand wave. Which conveyed, "Well how do you think I feel? Let's give him a bit longer."

Clay was willing to wait. He was after all sitting next to two of the best looking girls in the club, and possibly, though it was hard to tell for certain, just about the only ones here at the moment who were players. Most if not all of the rest were probably NPCs, or non-player characters, meaning avatars which were controlled by the club's AI rather than by other human patrons. Like most cyberverses nightclubs, this one was programmed to spawn NPCs to supplement the crowd as needed so that the joint was always filled more or less to capacity. But at least if you came in without a date you could always count on finding someone to hook up with. The NPCs were of course able to recognize customers, and generally speaking were programmed to be, well, rather accommodating.

That wasn't Clay's preferred company, though. He liked to know that there was a real human female somewhere out in meatspace whose mind was controlling the avatar he was with, for conversation as well as sensual activities. His own avatar that he'd chosen for the evening was actually based, though not strictly, on the appearance of his meatspace body. Which

meant a man in his late twenties of above average height and a trim, athletic build, olive skinned with naturally curling dark brown hair and green eyes. If his cybaverse avatar and his human self could be placed side-by-side, they could easily be mistaken for brothers, though certainly not for identical twins. It was refinement rather than radical redesign that Clay had undertaken for his virtual self, the self in which he typically spent the bulk of his time. That the differences were more superficial than profound was a source of no small pride for Clay, even though as a rule one had little reason to care about anybody's actual physical appearance in meatspace.

Whether Salma's virtual avatar similarly resembled her physical body he had no idea, since they had never even met in the flesh, but he certainly liked her virtual body well enough. She was a striking Latina beauty with high cheekbones, full lips, wavy dark hair pinned back off her forehead, and an hourglass body that would look good in a burlap bag, still less in the shimmering and form-fitting velvet, leather, and satin outfits which she liked to wear. Her present costume was almost demure: a kind of vaguely Renaissance green dress with ruffly sleeves, with a cloak worn over top of it. The relatively high neckline barely hinted at cleavage (albeit, very deep cleavage). The dress gathered tightly around her waist, then spilled over her hips down almost to floor length.

Cylara was a little shorter than Salma, blond-haired with pale skin and bright hazel eyes, framed by long lashes. Her slim body was clothed, or perhaps one ought to say sheathed, in a mostly black bodysuit made of some velour-like fabric which covered her from neck to hips, where it abruptly flared out into a skirt which draped her nice legs to mid-thigh. It revealed absolutely no skin and yet displayed every contour of the body beneath. The areas that weren't black were silver: a band around the throat, and two slashes diagonally across her body from shoulders to hips. The taut silver fabric, while not exactly transparent, managed to leave absolutely no doubt as to the precise location and general dimensions of her large nipples.

Black boots, silver gypsy mode jewelry and a headpiece, almost like a coronet, pinning her pale hair back out of her face, completed her clubbing ensemble.

Clay's own clothing was simple, and generally complementary with what his date was wearing. A sort of tunic under a jacket with some lace worked into it, casually open at the throat, and tightly fitting pants like hose, with a cape thrown overall. All black of course, no color about him at all, except for a large bloodstone gold ring on his right hand. The overall effect, quite deliberate, was a vaguely sinister yet plainly sensual air.

Salma turned her attention back to their booth and tapped on a touch panel at the back edge of the table. A menu screen popped up and she pondered a moment, then entered something. With a loud chime (barely audible under the circumstances) a matched set of three drinks slid out onto the table from within a panel. Each of the three picked up a glass.

"Cheers," Salma mouthed as they all sampled her selection. It tasted a bit like a white Russian, but with a prickly citrus-like aftertaste which Clay thought he recognized. Since their virtual bodies didn't get thirsty unless that response was specifically enabled, this drink must have some other purpose. Clay had his suspicions, knowing Salma.

For the first few minutes, he felt only a mild buzz, as if he had just drunk a shot. Then as he continued sipping his drink, a faint flushed feeling prickled on the backs of his hands and in his face. While he drank slowly, the two women had clicked glasses and practically chugged their drinks in one long draft. Sure enough, by the time his glass was empty the hot, flushed feeling had localized further down and he could feel his cock getting hard in his pants.

Salma smirked and said something inaudible, then reached impishly under the table to give his burgeoning manhood a playful squeeze. Cylara noted the gesture and looked at Clay and laughed. The points tenting the silver strips of her dress were now standing out like thumbs. Clay rolled his eyes, not altogether faking his annoyance. When Torch had set up this

outing, he'd sounded like he'd had more in mind than just hooking up with the girls for some performance-enhanced sex.

Several of the NPCs exited through one of the arched stone doorways. This sometimes presaged the entry of additional human patrons, as the club's controlling AI kept the population at the calculated ideal level. Sure enough, a few moments later a man recognizable as Torch walked into the club. He scanned the crowd and quickly picked out Cylara, who waved from their booth. Torch stepped into the zero-G area and launched himself into space over the dance floor, needlessly swimming like a practiced fish through the air towards their booth. As he reached it, gravity reasserted itself and he slid into a seat next to Cylara, who gave him a welcoming kiss and promptly captured his left hand in her lap.

Torch was an attractive young man in his middle twenties, on the tall side, crowned with a shock of flaming red hair which had earned him his nickname. His face and body were lean and chiseled. He wore a black silk shirt with expensive-looking dark jeans, topped by a sleek dark green leather jacket. His glittering green eyes conveyed a serious expression. He briefly shook Clay's hand with his free one, and nodded to Salma across the table. She said something. He half shrugged, meaning "Sorry I'm late but there was nothing I could do about it."

Clay leaned close and practically shouted into Torch's face. "Dude, so what's up?"

For answer, Torch reached into his jacket pocket and extracted something, which he placed face up on the tabletop. It was a gleaming silver disc like a large coin, embossed with a few letters and numerals and a couple of polished spots which were plainly electrical contacts. A cryptokey for somewhere in the cyberverses.

Clay turned the disc over to look at the mint symbols. Incredibly, the number 1690783547938250818 was etched around the edge, indicating the data source. This was the decimal equivalent of the hallmark commonly used by the Full Sings. "Holy shit! It's Justin's seal," Clay marveled in a

subdued tone that of course nobody heard. He flashed the reverse side of the disc at each of the girls, allowing them to read it. Their faces sobered and Salma raised an eyebrow at him.

Torch reclaimed the disc from Clay's palm and held it up for a moment, shaking it in front of their eyes, then restored it to his pocket. He also (regretfully) withdrew his other hand from between Cylara's satiny thighs. This elicited a pouty look but no protest. It was obvious the party was about to adjourn somewhere else.

Clay gestured in the direction of the nearest exit, which obviously meant "Let's ramble." The foursome got up from their booth and entered the zero-G area of the club, electing to hand-over-hand down the railings of a metal ladder to the ground floor, that being faster than floating over the dancers. At length they were in a hallway that opened onto the club, headed for some revolving doors marked "Lobby Exit." On the center post of the doors was a palm scanner, which each of them pressed briefly with their palm. This had the visible effect of shifting the doors so that they could leave, as well as the hidden effect of remunerating the club's operators for their use of the facilities.

In the plush and refreshingly quiet lobby were elevators leading to private rooms of varying descriptions whose general purpose was inferable. What looked like a door to the street outside was unlit and appeared locked. Very likely this particular virtual domain possessed but little implementation outside this immediate building. There was also a circular sunken floor area near the middle of the lobby, with a metal pedestal standing in its center. This was plainly the exit zone point, though it was not the place at which any of them had arrived.

It was untenanted at present, and they all walked in and stood around the central pedestal. Inset in its upper surface was a console incorporating a number of round depressions of various diameters and obscure labeling, into which cryptokey disks could be fitted. Torch spun the Sing disc around in his fingers until he located one where it fitted exactly. He pressed it face

down into the reader and rotated it until it snicked into place. Then he tapped a scan button. After a moment, holographic letters appeared above the console, in a warning red script: "Unable to zone to this destination from this location."

"Crap," Torch said as he touched a release button and recovered his cryptokey. "Any ideas?"

"Why don't we try it from the Mall of the West?" Clay suggested. That made sense. It was an extremely well-connected site.

"Where is this place we're going to, anyway?" Salma wanted to know.

"I don't know," Torch admitted. "I've never been there before. But the guy I got the key from claimed it was one of the new mansions of the dead, for the Last Trumpet Project."

Clay looked glum rather than excited. "And why did you believe him? Who was he, anyway?"

Torch smiled enigmatically. "A very good source, dude. You saw the origin seal."

"Yeah. Doesn't mean we're not on our way to Justin's garage, though."

Torch shrugged. There was obviously no question that they were going anyway. Clay produced a disc of his own, fitted it into the console. This time the scan came up green: "Zone point ready." Clay retrieved his key disc.

"Mall of the Western Hemisphere, here we come," he announced. Each of them grabbed hold of a metal railing around the console pedestal, and seeing this, Clay depressed the ZONE button.

The club's lobby winked out into a blank grey nothingness, silent as only the space between worlds could be. Their virtual avatars dropped their connections to the nightclub's servers, and negotiated a connection with the Mall's. This took only a second or so, barely enough time to register the flickering sensory input of being in between realities.

Then abruptly they found themselves in a broad courtyard flagged with white marble paving stones. High above, a hundred feet or more, a soaring

glass roof supported by a spiderweb network of graceful steel beams let the sunlight of early afternoon flood the courtyard. Efficiently cooled air breathed lightly on their faces, and gently rustled the leaves of the many large shrubs in planters along the margins of the vast room. A hubbub of voices and footfalls greeted their ears, punctuated with calls and laughter and the occasional cry of a child, expressing delight or frustration at higher sound frequencies.

Torch spun around slowly and then immediately headed for a map kiosk. The others followed. There was absolutely no point in wandering around this place without knowing where you were going. This Mall was so immense, that had it been constructed in meatspace it would have more than covered the former state of Rhode Island. Growing up organically in the cyberspace, it now consisted of millions of stores occupying an aggregate virtual area of several hundred square miles. Naturally, zone points occurred at frequent intervals along the various inter-connecting concourses. Even in virtual reality, shoppers only liked to stroll so far.

As they stood around the map, Torch efficiently located the nearest external zone point and noted the route to it. Salma wrapped an arm around Clay's waist and wiggled her other hand into his front pants pocket. "Glad to see you're still so happy to be with me," she said with a giggle.

Clay felt a brief surge of embarrassment and suppressed a groan. He'd neglected to reconfigure his avatar for their new cyberspace location, and the effects of the aphrodisiac drink back in the bar were still partly lingering. He did so now, activating with a thought a heads-up avatar control display that only he could see, on which he navigated to and selected "clear arousal response." Gad. He must be more excited about going to this secret Sing location than he'd let on to Torch.

"Thanks, hon," he said to Salma as they followed after Torch and Cylara. The nearby zone point was marked out by differently-colored tiles, with the console controls recessed in a wall. A family was using it, and the four young people waited courteously until they had all disappeared.

This time the scanning device, after a long moment, gave a favorable report of the mysterious Sing cryptokey. "Hot damn," Torch opined. It had been a good idea to try zoning from here. The Mall needed to accept zone-ins from the widest possible number of cyberverses locations, as well as to allow its customers to zone back to where they came from. If this key did indeed lead into a future dwelling for the dead, well, the resurrected dead were going to need to go shopping just like other folks. So it made sense that the destination would be on the list of permitted Mall access points.

Excitement spread visibly over Torch's face, and it was contagious. They drew in close and grasped the zone bar. Torch took a deep breath and pushed the ZONE button.

[T]here is no lower human lifeform – with the possible exception of pimps – than that which revels in its state-derived power to humiliate, extort, and generate misery. I am left with a disgust for my species.

-- [Glen Cook](#), *Shadow Games* (1989)

Chapter 6

A Chink in the Mesh

“Team Five, good to go,” came the voice over the speakers inside the aircar's luxurious but functional cabin. Roger Sarner grunted, expressing exasperation while suppressing his mounting excitement. “About time.” He keyed the transmit button on his console.

“Command to all teams: move in,” he grated, and released the switch. Transponder dots on his tactical map obediently started moving toward all entrances to the building which they had surrounded. Whatever security the mall rats had in place was about to get a big surprise.

Roger Sarner, Secretary of Homeland Security for the North American Federation, was a large man of about fifty. His graying military-style crew-cut complemented the harshly drawn lines of his face and his elegant dark suit to create a no-nonsense, all-business appearance. Sarner prided himself on the rapport and easy-going camaraderie which he maintained with his men, but never during a mission. At mission time he was as hard-ass as they come. It wasn't usual for a Homeland Security Secretary to command a field raid in person, but Sarner had reached a point where he no longer gave a rat's ass what other Federation officials thought about his doing so. Let them call him a cowboy or worse; he'd learned in a very hard school that the only way to get things done right was to go out and do them yourself. And to hell with the wimps and anarchist sympathizers who got their hairnets in a twist.

Their target was a brain house in San Mateo, California. The Bay Area had been a computing hotbed since before onetime U.S. Senator Albert Gore had made the tragic error of inventing the Internet back when. Back in the days when the net was still “cute” and people mostly surfed it for

nudie pics of actresses, most brain houses – or server farms, as they'd called them in those days – had been out front with what they were doing, even advertising and offering prospective customers tours of their state-of-the-art hosting facilities. But as commerce became digital, and unbreakable encryption became ubiquitous, and everything including the backbones went wireless to avoid centralized control, the computer servers hosting the worldwide mesh gradually went underground and into hiding. As exogenous commerce claimed a larger and larger market share, the computing infrastructure hosting virtual reality became increasingly invisible. Nanosolar power and fusion generators, which eliminated the power utility grids, finished the job.

When over the span of less than a decade the tax base melted away into the realm of exogenous digital commerce, desperate governments had no real way of pulling the plug. Servers facilitating illegal tax-free economic activity (euphemistically called “frictionless commerce” by cyber-anarchists and their sympathizers) could be situated anywhere: in a store basement in Michigan, in a closet in Bangladesh, in a shed out in a Nebraska cornfield, in a mountain village in Peru – or under a mostly abandoned apartment house in San Mateo. Operating even a tiny brain house could be a lucrative proposition if it carried enough traffic, lucrative enough that a lot of people around the world started doing it, despite the total illegality of it in most places. Eventually it was the tax and official banking sectors that were exogenous to the rest of the world, which had moved its economic activity into the cyberspace, and left the authorities standing around outside it with their thumbs up their butts.

There was one known way to track illegal commerce to its hosting. It involved the use of a bugged avatar. You sent your man into the virtual store to transact some business, and then did some fancy traffic analysis to figure out where the packets going in and out of his mesh jack were coming from. Onion routings, proxies, VPNs, and randomized packet forwarders made this task extremely difficult. But occasionally somebody would be

using some sloppy, second-rate routing software and a pattern would emerge which could be detected by Homeland Security's mesh traffic analysis AI, Ferret.

Today's target was extra special. Not just some mom-and-pop operation hosting discount virtual Grand Canyon tours for the Sing kiddies, but what was probably some number of mainline stores located in the Mall of the Western Hemisphere – assuming Ferret had got its sums right.

Some years ago, when the Mall was getting to be a big deal, the government of the North American Federation had pointed out to the Mall folks that as the major legitimate government actually located in the western hemisphere, it was entitled to point-of-sale tax revenue from all sales transactions conducted in the said Mall. The Federation Congress had passed a bill levying a five percent tax. A mere five freaking percent! And the Mall's Chamber of Commerce had actually taken a vote on it, and sent back an official reply stating that the Federation's assertion of jurisdiction was rejected and the tax would not be collected, since the association's members could find “no legal or ethical justification for the mandatory diversion of any portion of Mall sales revenue to an external, non-member entity to whom the money does not belong.” Outrageous! And the spineless sons of whores in the Congress just shrugged their shoulders and said there was nothing they could do about it, since there was no way they could enforce the tax anyway.

Roger Sarner was about to show them different. His men were moving into the building now, advancing through every entrance simultaneously in order to prevent anyone inside from escaping. The muffled sounds of the nearest team's forcible dynamic entry were audible from inside the command car. Sarner looked over at his driver, the only other person in the car with him, and noticed him running an emergency liftoff check, just in case something went explosively wrong and they had to leave the scene in a hurry. Sarner simply didn't trust AI pilots, which is why he always had a human one. He gave the driver a nod of approval, which probably went

unnoticed, and scrutinized his tactical console again. All teams were fully inserted into the building now.

“Contact! Team Two, suspect contact,” a voice reported. Sarner waited for more information before responding or giving instructions. “One male, one female, they're jacked in,” the voice continued more calmly. Casually, Sarner keyed his mic again.

“Take into custody for questioning,” he ordered, though that was standard procedure anyway. As his teams continued their room-by-room search of the premises, three more apartments were found to be inhabited, with evidence of recent occupation in several more. Some or all of these residents must be the operators. But as he'd expected, it wasn't until they got to the basement level that they hit pay dirt.

“Team Four, presence of server equipment confirmed in sub-basement. Also one fusion generator,” the team leader continued after a moment. Sarner smiled in grim satisfaction.

“Rip out anything which looks like a data store,” he ordered. “Slag the rest. Don't worry about shutting it down first.” He sincerely hoped a few hundred goddamned illegal shoppers got booted all the way back to their jacks.

Teams One and Two had the suspects kneeling on the ground in a line in front of the building now. Sarner turned away from his console and slid the door open, jumped lightly out of the aircar to the ground. He walked casually but menacingly toward the suspects. Poor dumb bastards, most of them looked groggy and scared, like people startled out of a sound sleep. Having a good time in some virtuality somewhere, and then shazam! Suddenly back in the ol' meatspace body getting the cuffs clipped on. *Welcome back to reality, you gutless wire heads.*

One of his team leaders met him in front of the line of kneeling geeks, holding out a handful of identity cards. The man nodded at one of the captives, a young guy with unkempt hair and a dazed expression, wearing little more than a T-shirt and boxer shorts. “That one had a hard-on when

we unplugged his jack,” the team leader reported *sotto voce* with a smirk. Secretary Sarner chuckled and began scanning the ID cards into a palmtop police datapad. This raid was going great, just great.

The IDs of the five people before him, no wait there were seven, so at least two of them must not have IDs – well that was something else they could be busted for, anyhow – did not show up as anybody important. All Americans between 20 and 42, three male, two female. No criminal records, no warrants; also no registered assets, no recent job history, and as usual no tax file data. Typical unpatriotic riffraff. Obviously surviving somehow through illegal cyberverspace economic activity, but nothing to show which ones were connected to the contraband computer hardware which even now was being melted down to its constituent molecules in the basement. Though not surviving all that well by the look of things, Sarner thought as he looked the bunch of them up and down.

Of course you couldn't always tell, he reflected. Some of these people might be rich as lords in the cyberverspace where they spent nearly all of their conscious hours. Personally he didn't understand what good it was to be rich in a world which didn't even exist, when in real life you lived in a run-down, half-abandoned shithole like this.

They were out in front of the apartment building, in what should have been a lawn, but it was mostly gone to weeds and dirt which nobody had bothered to mow or water in a long time. It had been years since the metal siding had seen any repairs. The windows – which no one had ever bothered to replace with self-cleaning glass – were grimy with seasons of blowing dirt and rain, and the paint was peeling off the trim. The nearby street was slowly crumbling into gravel. Everything in the real world was going to hell. People just didn't care anymore. This was what you got when you turned your back on government, which used to make communities sparkle, and made people productive and happy, but no longer had the means to do its job.

A burst of anger seized him, as he looked this sorry lot of dumbshit

cyberpunk anarchists over one more time. “Not so smart and gorgeous now, are ya?” he said to the prisoners at large, with all the well-practiced contempt he could put into his voice. Several heads turned to look up at him. The others looked away, or stared numbly down at the dirt. “We don't know which of you was operating that illegal brain house down in the basement, so we're going to charge all of you with operating an unlicensed business, tax evasion, racketeering, conspiracy, and anything else we can think up. On the other hand, it's likely that some of you *do* know who was responsible. The ones who rat out the criminals will be dealt with leniently. The ones who don't will suffer the same penalties as the guilty parties, just for being fucking anarchists who resist legitimate authority. There won't be any cyberverses jacks where you're going. Oh, and the two of you without valid IDs are in deep shit regardless. I think that about covers it.”

The older woman looked up with a frown and dared a protest. “Don't we get an attorney? Or don't citizens have rights anymore?”

Sarner was provoked, but kept his voice calm to demonstrate his control of himself and the situation. “Oh, you're a citizen now, are you? Haven't paid a cent in taxes or given a lick of anything back to your community in probably twenty years, but now you want your rights, oh yeah. Well don't worry, you'll get your attorney all right, soon as you get to the holding pen in San Fransisco. A public defender of course, since according to your ID file you have absolutely no money, none, zero. Gee, wonder how you pay the rent.”

Sarner handed the cluster of IDs and the viewer back to his team leader, and looked up to see the leader of Team Four emerging from the building. He gave Sarner a high sign and pumped his fist in the air. Sarner acknowledged the destruction of the brain house hardware with a wave conveying well done. He looked once more at the line of kneeling and cuffed prisoners, and shook his head sadly. There was truly nothing more to say to this useless scum.

Abruptly he turned on his heel and stalked back to his command aircar.

His driver buzzed the door open and he boarded. Now there was nothing remaining but to return to headquarters and wait for the team leaders' detail reports to come up through channels. A personal visit to an operation like this was always worthwhile to punch up morale and let command demonstrate some hands-on interest, and the proper attitude for the rank and file. But somehow he felt incomplete, like there was something he could have done or should have done but hadn't. He didn't know why, but the aftermath of raids like this always left him feeling like a guy who'd thought he was about to down a scotch and soda, but found himself chugging mere ginger ale instead. Yet the vague feeling of dissatisfaction always left him eager for the next raid, pulled him ahead, fueled his eagerness, sharpened the spurs of his duty. And that was certainly no bad thing. He figured he had just about the toughest job in the whole world ahead of him.

"Take off," he ordered the driver crisply. "We're returning to headquarters."

"Yes, sir." Immediately they rose, circled the sordid raid site once, and then flew off to the northwest, where their aircar vanished into the growing afternoon cloud cover.

One brief word will tell the whole story: all arts that mortals have come from Prometheus.
-- [Aeschylus](#) (525 B.C. - 456 B.C.)

Chapter 7
Within a Lodge of Knights

The gavel banged on the podium, and the hubbub of voices began to subside. "Everyone take your seats, please. Will the Guardian please secure the doors." After a few moments to allow some late entries, the door to the large meeting room was firmly closed.

"My Lord Chancellor, the doors are secured!" the man who had closed it said loudly in the direction of the podium.

"Let the Earl Marshall and his aide obtain the passwords from all present, so that we may know them to be Knights of our Order."

Two men in Romanesque helmets and long red cloaks, carrying wands of office, approached the podium and bowed. The more decorated one, the Earl Marshall, climbed the three broad stairs to the dais on which the podium stood before a short row of high-backed upholstered wooden chairs. He approached the Lord Chancellor, who stood next to the lectern, gavel in hand, and leaned his head close to him. The Chancellor whispered in his ear and gave him an odd handshake followed by a smile and a familiar pat on the shoulder. The Marshall straightened and moved to the next man sitting in one of the chairs against the wall behind the Chancellor, to the latter's right, and repeated his performance. Simultaneously the Marshall's aide stepped up to begin examining those seated behind the Chancellor and to his left. The two men worked their way around the room in opposite directions, beginning on the north wall, the Marshall then proceeding north to south along the west side with his aide paralleling him down the east side. There was some light, whispered conversation and exchanges of various subdued greetings between those seated near each other, as the two examiners made their circuit of the room. This took a little time, since there were easily fifty men seated along each wall, leaving the center floor

area vacant.

The room was large and spacious, sumptuously decorated along the lines of a Christian church, interspersed with a Roman military theme. The gilt ceiling high above was lit by many crystal chandeliers. The floor was made of flagstones framing a central mosaic design, depicting Jesus whipping the money-changers from the temple. Behind the dais at the north end of the room was a vast looming painting, also showing Jesus, bearing a sword in one hand and a crown in the other, about to invest with both a kneeling knight who had his back to the viewer but his face turned up to the radiant glory of the visage of Christ. Clusters of high-backed chairs stood on a raised dais at the north and south ends of the room, with a trio of such chairs also in the exact center of the longer east and west walls, but at floor level. All of the special chairs, which resembled nothing so much as thrones, were occupied by officers decked out in various regalia, consisting of helmets, capes, medallions of office, wands, staffs, tasseled swords, and the like.

At length all had been examined in the passwords, and the Earl Marshall and his assistant met up in front of the south end. The aide saluted his superior, and then both turned to face the officer seated in the center chair at the south end. They bowed, saluted him military style with their wands, and then pivoted on their heels and stood at parade rest facing north. The officer they had saluted stood and addressed himself to the Chancellor, facing him across the length of the chamber.

“Lord Chancellor, your officers report that all present are Knights of our Order duly entitled to attend these proceedings,” he shouted.

“Thank you, Vice Chancellor,” came the response from the opposite end of the room. “Will the High Priest please lead us in our opening prayer.” The Lord Chancellor banged his gavel on the lectern three times, and everyone rose to their feet. The High Priest rose from his station at the center of the east wall and waited a moment for quiet. His regalia plainly resembled that of a bishop, with a tall hat like a miter and a crooked staff

like a crozier. He was an older man, with bushy grey eyebrows and gnarled hands resting lightly on the enormous Bible which was open before him on a stand.

“Let us pray,” he intoned solemnly, and the assembled members dutifully bowed their heads. “Our Lord in Heaven, we beseech you to look down with favor upon your Servants gathered here to further your purposes upon this troubled Earth. Bless our minds and fill our hearts, so that we may hear your call, understand your intent, and find the courage always to do your will. We pledge our lives and our earthly fortunes to the sacred Cause of preserving your people in their true human nature, yea verily as you did create us in the Beginning. Help us to reject the temptations of the Evil One in these times of trial. Create in us a generous, self-sacrificing spirit that forgets not that it must one day return to its Maker and be judged. Inspire us with thy wisdom so that we may not fall to the cunning of thine enemies. Endow us with the strength and conviction to be steadfast in our purpose. Bestow upon us harmony and concord that we might serve you unitedly. And when the strife of this life is over, may you welcome us before your Throne, after the example and in the glorious Name of your only Son, who taught us to pray—”

Here the High Priest paused momentarily, to give everyone present time to recognize their cue and take a breath. As he continued, the voices of every man present conjoined with his. A low susurrous of male voices – for there were no women present – caressingly shaped the ancient phrases and quietly filled the hall. “Our Father, who art in Heaven, hallowed be thy Name. Thy Kingdom come, thy will be done, on Earth as it is in Heaven. Give us this day our daily bread, and forgive us our trespasses, as we forgive those who trespass against us. And lead us not into temptation, but deliver us from evil. For thine is the Kingdom, and the Power, and the Glory forever. Amen.”

The assembled members raised their heads, and looked expectantly up to the Chancellor at his podium. “The members will give the sign of our

Order," he commanded. In unison, everyone present briefly pressed the first three fingers of their right hand horizontally across their forehead, then across their lips, and finally across their heart. The Chancellor answered them with the same motions, then raised his arms in the air and exclaimed: "Hail to the Covenant of Christ!" The members standing along the south wall, led by the Vice Chancellor, cried out the same words, echoed by those standing along the west wall, and last by those on the east side. When the final cry had died away, the Chancellor continued: "Right Supporter, perform the duty of your station."

The man standing at the right hand of the Lord Chancellor's empty chair called out: "I hereby proclaim this Lodge of the Knights of Jesus open in the first degree for the transaction of lawful business."

"Officers and knights, so be it," the Chancellor intoned.

"So be it," echoed the assembly.

"Guardian, you are now permitted to admit those outside who are in possession of the passwords, and allow those present to depart. The Lodge may be seated." He banged the gavel a single time, and the assembled members sank into their plush seats. After the rustling and murmured conversation subsided, the Lord Chancellor looked over his shoulder at a man seated behind him on the north wall, and receiving a faint nod in response, turned back to the hall and spoke again.

"Since we have a very special visitor tonight, I'd like to suspend our normal order of business so that he can address us all on a subject of paramount importance. I refer, of course, to the Reverend Maxwell Cleary. As you all know, Reverend Cleary was a founding member of our Order, and is a three-time Past Vicar-General. Since neither he nor his topic tonight require any further introduction, I shall without further ado yield him the floor. My brother knights, I give you Sir Maxwell Cleary."

Reverend Cleary rose from his seat, stepped forward, and shook the hand of the Lodge's Chancellor, to the eruption of enthusiastic applause. The Chancellor assumed his throne-like chair in the back, while Cleary

proceeded to the podium, where he held up his arms and waggled his hands for silence. This was not immediately forthcoming, as the gathered knights continued to cheer him despite his gesture.

The Reverend Cleary was a man of unprepossessing height and average build, with dark, curly, auburn hair worn short and beginning to go grey around his temples. He appeared to be in his middle fifties. His dark suit was conservatively elegant without being pretentious, his tie loosened slightly around his collar to convey a certain casual deportment. His face was not particularly remarkable, though well-defined with strong, masculine lines, except for the unusual fact that he wore glasses. This was not a mere affectation on his part. His vision in fact required a modest correction, and his refusal, on grounds of principle, to allow his eyes themselves to be altered from how God had made them was an integral part of his legend.

Cleary acquiesced to the ongoing ovation with a what-can-I-do shrug and a kindly smile behind twinkling blue eyes. He stepped away from the lectern and made a casual but respectful bow. The applause increased in intensity, then at last began to subside as he stepped back behind the podium and again motioned for quiet. Finally, complete silence fell.

“The peace of Christ be with you! My brethren, I thank you most sincerely for that overwhelming reception. Like all of you, I too sometimes become distressed and discouraged at the pervasive strength of the evil and folly that sweep the world in these woeful latter days which we all share. But whenever I come back to a KOJ lodge to speak, it is truly like coming home. And when I behold your enthusiasm and commitment for our great Work, it refreshes my strength and fills me with renewed hope. I thank you all for the great gift of your support and appreciation, because it reminds me that no matter how bleak our outward circumstances may become, united as Brothers in Christ we can triumph over even the greatest adversity.” Cleary paused for breath and a smattering of further applause. His voice was smooth and practiced, its tone a little weary but expressive of great resilience and unshakable conviction.

“My friends, you know that the Singularian folly by which the Devil has bewitched so many of our fellowmen has been growing in power and in menace. But this of course is nothing new. So while we would be wrong not to be outraged by recent turns of events, we must also take care to view these latest developments in their proper context and proportion. What our response should be to these latest absurdities and blasphemies is what we must decide. Yet I tell you now that I believe that they may yet provide us with a truly exciting opportunity.

“But before discussing that opportunity further, I think it were only proper to review the history leading up to these events. For millennia, Man has striven with the brain which God gave him to master his world and improve the sophistication of his arts, to the betterment of himself and of his world. In the beginning, this alleviated much suffering and greatly improved the lot of Man. Inventions such as fire, agriculture, metal tools, building and weaving techniques, and medicine, unquestionably made life better for all. In those days the figure of Prometheus – who gave fire to Man – was a friendly figure, who helped human civilization to advance. So too Athena, the ancient goddess of wisdom and artifice, or what we would in modern times call technology.

“Yet there is, sadly, another side to the unleashing of human innovation. Prometheus is also a personification of the Devil, and he was horribly punished by the gods for setting mankind upon the path of technological development. Even in ancient times, great thinkers wondered where the drive for discovery and invention coupled with human arrogance might someday lead the human race. Saint Augustine warned that that which improves the earthly lot of Man also tempts him to turn away from God.

“In the ages which followed, the fears of those early religious thinkers indeed came to pass. It became commonly believed that life on this mortal Earth was actually more important than the eternal afterlife which all those who believe in their salvation will spend with God. Men decided that the intelligence which God had given them should be used without limit or

restraint, and moreover that it was actually the key to understanding the mind of the Creator, through the scientific study of His Creation. The life of the mind became preeminent over the life of the spirit. The doublespeak of twisted historical interpretation has given these eras names like the Renaissance, the Reformation, and the Enlightenment. But in reality they were the centuries in which the darkness began to fall. The primacy of religion was questioned; churches fragmented and fell into factions; men made a new religion of earthly pleasures and riches; rulers divinely anointed to lead the people on the paths of righteousness were toppled, and replaced with rulers elected because they promised the people an endless increase in their worldly estates. The Ten Commandments were shattered and the golden calf was raised on high!

“At last, in the century just past, the arrogance and folly of Man and his technology were raised to heights undreamed of by the earlier humanist philosophers. Man's technology became at length so powerful that men not only turned away from God, they aimed even to usurp the place of God. Nuclear energy gave mankind the power to destroy as only God can destroy. The abomination of genetic engineering gave men the power to tamper with the basic structure of life itself, daring to “improve” upon God's own handiwork, and even to design entire blasphemous new species. Nanomedicine allowed men to heal as only Jesus could heal, and finally to withhold mortality itself from Man, who is thus deluded that his earthly life need never end.

“Worst of all, computing technology provided the ability to imitate the mind of Man itself, first by extending its reach and ultimately by duplicating its entire function. Thus the Devil has at last recreated Man in his own image: a machine, having intelligence but no soul, a clever mind but no spirit. A body which did not come from God and will not return to Him, but is cut off from the light of heaven, forever. The dis-transfiguration of Man is now complete: he is no longer from God, belonging to God, and a mere temporary resident of this world. Now he is of the world, a creation of his

own artifice, serving only himself, owned not by God but by the Adversary. He is apart from God. Perhaps he deems that he is God. But in the end he is nothing. He has played away the truth of himself, sacrificed all that which made him what he was.

“My friends, it is in this stark context that we must view the latest developments in order to comprehend fully the depths of their depravity! We are told that a great Scanner glances backward in time and copies the body and brain of a person shortly before their death. This copy is then fed into a computer core where it runs as a program. And we are then told, with a straight face, that this procedure has somehow brought the dead back to life!

“Oh Man, how fallen you have become in the depths of your arrogance! How can ye not see the terrible absurdity of your false resurrection? We are told that the copy is the real man, because the scan was made before he died. You see how the Devil acknowledges the truth of the soul, but twists it. For how can a soul be copied by a scanning machine? And what could possibly prevent that soul from going home to God when the body dies, whether the body was ever scanned or not? The “resurrected” copy is a mere simulacrum of a man; but it is not a man. It may be an accurate reflection of the man, having his knowledge, his memories, his skills, even his personality. But if it has not his spirit, how can it be the man himself? By necessity, it is a man without a soul, a mere machine and not a human being.

“We are told that this is analogous to those who willingly gave up their biological bodies altogether in order to exist on “higher substrates.” If they are alive, the argument goes, then so too are these deceased ones who were scanned and copied. And thus the Devil lies with the truth, for even as these scanned beings are not alive, and are not human, so too those who have given up their bodies are no longer human, and likewise have no true life.”

Clery paused in his oration, knowing full well from the rapt silence that

he had his audience enthralled. Had he been a mountebank, he would have smiled to himself. But he was not. Reverend Cleary was perfectly sincere.

“By rights the world should respond to this announcement with a torrent of laughter that would shake the globe to its foundations,” he continued. “But alas, it is a measure of how far the Devil's influence has now spread that many throughout the world are taking it all too seriously. As always, the temptation which the Devil offers is sweet and compelling: to be reunited with those whom you have lost, without having to wait for your own passage through death. To gain the chance to know your own ancestors, or great figures of the past. But it is all a lie, and a distraction meant to keep you from what is truly important: to know God, and to be reunited with Him.

“My fear is that this travesty opens the final act in the great drama of human history. The Devil commences playing his end game. If this folly is not checked, it may lead, over time, to a false copy being made of every single human being who has ever lived, and died. And they will live together, not in the paradise of the next world, but in simulated paradises contained within this world. And so a false resurrection will be substituted for the true resurrection, a virtual heaven for the spiritual heaven, and an indefinite earthly life for eternal life. There is a reason why the Evil One's minions in this world have named this final, ultimate act of human usurpation “The Last Trumpet Project.” There is a reason why they dare to style the virtual environments in which their scanned simulacrum will reside as “the mansions of the dead.” That they steal the very terminology of Scripture is proof, if any more were needed, that this is the final and ultimate blasphemy, in which the Devil's Technology attempts to supplant God's Theology, whole and entire.

“In the end, my brothers in Christ, it will come down to faith, as it always does: if you have faith in the Resurrection of the Living Christ, then you will not seek to preserve your body or your consciousness forever in this world. You will trust in the promise of the New Testament, you will die, you will be

redeemed, and return to God whence you came. But if you falter in your faith, if your courage fails, then you will waver and accept the Devil's bargain, and exchange your immortality for the false coin of earthly continuance.

“It is with deep regret that I inform you that untold millions of our fellowmen around the world are lining up to do exactly this. As prophesy warns us, few are those who cling to the straight path of faith in the Last Days. But for those of us who do cling to that path, it falls to us to make it clear to as many as possible, as well as we can, just what is truly at stake: nothing less than the very soul of the human race.”

Again Cleary paused, to scan the faces of the men around the room looking up at him, waiting for him to offer them hope, a plan, some course of action whereby they could make a difference. He had one.

“My fellow Knights of Jesus, a great Work is beginning. For behold God has moved the hearts of some of those who call themselves Sings, and whose earthly bodies are polluted with the filth of nanotechnology and computer technology, and caused them to repent and ally themselves with our cause. Even now they are helping us to track down the very brain houses where these atrocities are taking place. For it is the Devil's great weakness that everything in the false world of virtual reality must yet be tied to a physical place in the real world. We will discover those places and we will destroy them!

“Our Lord has also spoken to the hearts of some of those who fill important posts in government. And I tell you that they too are making common cause with us! For many centuries, the state has been godless, secular, serving the cause of Evil. Humanist philosophers strove to find a basis for the state derived from political or economic theories, based on democracy, or utilitarian social values. And in the end those in government who thought to ground the state in this world and its concerns received their just reward: technology overtook their function, made them irrelevant, and swept them impotently aside. Their error lay in attempting

to root political authority within this world, rather than in the next. To derive power and legitimacy from Man rather than from God. Behold, it is now Our Father's purpose that our government officials repent of their past follies and join with us in our struggle. The Apostle Peter spake to Jesus saying: 'Here are two swords,' and Jesus answered: 'It is enough.' Church and State are the twin swords, and verily Jehovah is reforging them both to be wielded in our cause!

“With this union accomplished, our hope brightens. We can lay waste to the computing hardware where these blasphemies are being perpetrated, and in a coordinated, simultaneous fashion all around the world. Even now, the list of targets and the strike teams are being prepared. And when the multitudes perceive that the faithful of God's Church and the remnants of the world's fallen governments are working together to combat this evil, their complacency will be shaken and the Devil's hold over many shall be loosed. Behold how the Lord stretches out his hand to aid his faithful even as the Adversary's victory looms nearer! How else could so many hearts change so much, and at such a critical moment?

“My brother knights, I tell you this now so that you will understand that the moment is coming which you have long awaited. The Order will shortly call upon you to render that ultimate service which you offered when you joined yourself to its membership. Your marching orders are on their way. It is time to march to holy war as Christian soldiers have always marched when Called. I am proud to march beside you. I am honored to fight with you. And with God's help we will be victorious! We shall save many souls in the months ahead. The Devil may have this world within his grip, but he shall not have the faithful! He shall not have those who repent! He will not take those who are willing to live and die as the example of Christ instructed us!”

Cleary abruptly lowered his voice back to conversational levels. “My friends, I believe the final battle with Evil is about to be joined. May God bless and keep us all.”

As Reverend Cleary fell silent, the assembled knights rose to their feet in a spontaneous, thunderous ovation. They cheered, they raised their fists high in the air. Some whistled, some wept silently even as they applauded. The Lodge's Chancellor approached Cleary and embraced him, as if on behalf of everyone present. With a final wave to the assembled brothers, Reverend Cleary returned to his seat and the Lord Chancellor banged the gavel once to restore order.

"Continuing with the day's regular business," he said as everyone became seated and quiet once more. "Mr. Secretary, are there any new member applications before us this evening?"

A tall man seated behind a desk on the floor to the Chancellor's right rose to answer. "There are none upon which a ballot must be taken tonight, sir. But there are four new applications which have been received, for the following applicants: Timothy Sparing, Brigham Smyth, Joshua Arrens, and Louis Mellingham."

"Then let the examining committee interview the applicants at their convenience, and report their findings to the Lodge at our next regularly scheduled meeting."

"It will be done, my Lord Chancellor," the Secretary promised, and was seated.

"We will now hear the reports of our standing committees," the Chancellor announced.

Reverend Cleary sat back in his plush seat and let the ongoing meeting blur out of his mind's focus. Now that his speech was finished, he was remembering how tired he was, and how worried. Things weren't really likely to go as swimmingly as his speech suggested. It was essential that he inspire and motivate others, yet these days he found himself praying for strength and faith, and wondering who was going to inspire him in turn. There was such a very long way to go, and he was already weary.

It was no easy task, to save the world from itself.

I think I have shown that there are good scientific reasons for taking seriously the possibility that life and intelligence can succeed in molding this universe of ours to their own purposes...
-- [Freeman J. Dyson](#) (1959)

Chapter 8 A Slice of the Big Apple

Clay, Salma, Cylara, and Torch found themselves standing in the lobby of a posh hotel. The ceiling soared many floors above them, with railings overhung with potted vines ringing the atrium over their heads, marking where each floor opened onto the hotel's hollow central core.

"A hotel simulation?" Cylara said, her voice slightly acid with disappointment. "Well that's kind of a let-down."

"Yeah," Clay was forced to agree. "And it's not even open, by the looks of things." Looking around, they saw that he was right. None of the desks or counters were staffed, there were no guests sitting anywhere in the lobby, and the lights were dimmed.

"Well the point of a simulation for the dead would be to make them feel comfortable, not throw them into some exotic environment right away," Torch commented equably. He didn't seem much put out by the ordinary surroundings, and was looking around with interest.

"He's right," Salma agreed. "Let's take a peek at what's outside the building." She abruptly started walking toward what appeared to be the street exit, a set of brass revolving doors. The others followed.

Clay noticed a flashing indicator on his heads-up visual interface display. One tiny corner of his vision had ceased to be transparent and was blinking to attract his attention. When he glanced directly at it the flashing indicator vanished and was replaced by some text: "Recommend clothing style reconfiguration." Well, naturally. They were still dressed for the zero-G nightclub, and by the looks of this place they were now in a simulation somewhere in the past. As soon as he thought this, the interface offered him a short menu of choices: "Cool/Hip, Powerful/Wealthy,

Common/Inconspicuous, Exotic/Unusual, Shady/Disreputable.” With a quick flick of his eyes he elected to blend in with the crowd. Instantly his clothes altered to a pullover shirt and denim pants. The others did likewise by the time they reached the hotel doors. Salma was now wearing casual slacks and Cylara a medium length skirt and blouse.

There were some virtualities where the visitor could likewise control their own individual perception of the appearance of others' avatars, but this was very much the exception. The ability to control one's own appearance and rely on the fact that other people saw you as you wished to appear, was so fundamental to self-expression that by common consent most worlds vested control of avatar appearance solely with the avatar's owner.

The revolving doors proved to be locked, but there were doors on either hand with push bars behind them which would open them, even though locked from the outside. They had no sooner opened these than a voice called from behind them.

“May I help you?” The four spun to locate the source of the voice. About ten paces behind them stood a nicely dressed man in a dark suit, perhaps a hotel manager. “I'm afraid we're closed for renovations.”

“Right, sorry to bother you,” Torch replied. “We just wandered in by mistake.” They made their exit onto the street outside before any further conversation could take place with this personage.

“AI guard?” Clay wondered.

“Maybe, who knows?” Torch replied. “Whoa!”

They stood on the sidewalk fronting a busy street, full of automobile traffic. It was a warm, late summer afternoon. A few fair-weather clouds peeked around the edges of the tall buildings which formed a steel and concrete canyon around them. The people hurrying past on the sidewalk spared them scarcely a sidelong glance as they emerged from the closed hotel. Instinctively they picked a direction and began walking briskly down the block.

When they reached the corner, Clay paused by a newspaper machine and nodded at it. Its window displayed a copy of the *New York Times*, and the leading headline concerned an upcoming presidential campaign debate. Clay scanned it for a moment or two, then turned left and began walking down the next block. The others stayed close. "Vice President Bush and Governor Dukakis. That means we're in New York in what, 1988?"

"Yes," Salma concurred.

"Would that be George the Second or George the Third then?" Cylara asked almost absently, as she looked at the city around them.

"The Second," Salma answered.

"Don't gawk around like that, Cy," Clay warned. "People will think you're a tourist and it'll cause us trouble."

"We are tourists," she laughed.

"No," Torch said a bit brusquely. "We're trying to find out what's going on here." Keeping their heads down and stalking along purposefully in silence like the natives, they meandered another couple of blocks from the hotel.

"This is quite the simulation," Clay offered after a few minutes. "People, buildings inside and out, all the period details."

"Yeah," Torch agreed. "Wonder if the whole city is simulated?"

"That would mean there were what, ten million NPCs here?"

"Something like that. Look, there's a park." In the next block they could see a small park with trees and fountains and some benches in the shade. There was also a hot dog vendor with his cart parked at the corner. Clay ambled toward him purposefully. "Let's get a bite and sit over there on that bench and talk." By the time he reached the hot dog stand he had reconfigured his attire to include a leather wallet in his back pocket, supplied with local currency in various denominations. The hot dog seller interacted with them quite nonchalantly, making them their food as they requested, offering them drinks, giving Clay his change.

They sat together at two benches set with an acute angle between them,

in the vertex of a raised, wood-framed berm with shrub evergreens planted inside it. They had for the moment a little privacy around them as they savored the flavors of their food and the warm afternoon sun, which gleamed over the length of a long, traffic-choked street running west.

“Very convincing simulation,” Torch opined. “But what's the purpose? Fooling dead New Yorkers into thinking they're still alive?”

“Acclimation?” Salma suggested.

“Maybe they gradually replace the NPCs with the real people they were simulating as they bring the actual ones through the Scanner,” Cylara offered.

“That's a thought,” Clay said around a big mouthful of hot dog and sauerkraut. “I think all of these are NPCs though.”

“I wonder if they all start out at the hotel?” Torch asked as he set down his soda. “It wasn't open. Maybe there are no Last Trumpet folks here yet.”

“I would guess that the hotel is a processing and orientation center,” said Salma. “So you're probably right. This simulation isn't in use yet.”

“So why is it running? Or did it all boot up when we zoned in here?”

Salma shrugged. “If it did, someone or something will notice that it's running now.”

“Uh-oh,” Clay said in a low voice. “Speak of the devil.” He nodded toward a man approaching them. It was the same darkly elegant dude they had glimpsed in the hotel lobby.

He stopped a few paces in front of them and smiled reassuringly. His hand opened at his side and suddenly it was holding a folding chair, already opened, which he placed on the ground. He sat facing them and looked at each of them in turn. This being was obviously no ordinary NPC, to break the rules of the simulation so casually.

“You do not belong here,” he said pleasantly.

“Um, who are you?” Clay asked.

The man smiled again. “I am the Custodian. Why have you come to this virtual space?”

“Just looking,” Torch said, matching his calm and easy tone.

“You're the superuser AI?” Clay asked.

The Custodian nodded politely in acknowledgment. “And you are all living projections. You are contemporary. You are not our intended clientèle. Why are you here?”

“Like I said, we were curious about this virtuality, so we came to check it out,” Torch elaborated.

“You did not know then, what you expected to find?”

“That's correct,” Salma responded. The Custodian appeared to consider.

“Yet you can only have come here by using an unique cryptokey disc, which if I am not very much mistaken is presently in your pants pocket, Mr. Torch.”

Torch looked confused for a brief moment. “Yes, well of course. That's what we wanted to check out, where the disc went.”

“And so I would like to know where you obtained it,” the Custodian said evenly.

“Um, from a friend.” Torch's three companions looked closely at him at this point, since he had never really satisfied their curiosity on this particular point, either. The Custodian blinked and gave him a measuring look.

“A check of the available access logs for cyberverses virtualities in which your private key fingerprint appears, correlated with those of your associates with whom you have entered those virtualities in the past three months, strongly suggests that you do not have any friends who would have had legitimate access to a copy of the cryptokey that you now possess.”

All four of them stared drop-jawed at the Custodian. It was practically axiomatic that supervisory AIs in a given virtuality did not have access to information or data stores outside the particular cyberverses location for which they were responsible. It was also well settled that tracing a particular person's key fingerprints across very many cyberverses hosts was practically impossible, given that so many virtualities were run by

independent hosting companies which did not share customer data with one another. Packet routing traces were infeasible. What kind of mesh spyware system could this AI possibly be tapping into? Or was it merely bluffing?

"I don't see how you could be in a position to know that, sir," Torch replied levelly.

The Custodian smiled, not unkindly. "All of virtual reality exists in the form of data patterns, just as all of physical reality exists in patterns of what are called matter and energy. If you can perceive the pattern of the whole, you can also spot the pieces of it that do not fit properly."

This of course was borderline preposterous. "And you are able to do this, Custodian?" Clay asked seriously.

No smile this time. "Not I."

"I got the disc from a friend," Torch said, betraying impatience for the first time. "He said it had something to do with the mansions for the Last Trumpet Project. It bears the seal of the High Sings. And from what you've been saying, I'd have to guess my friend was right."

The Custodian nodded pleasantly. "Mr. Torch, did you receive this cryptokey in real reality, and upload it through your cyberverspace interface?" Abruptly, the Custodian was holding the coin-like disc from Torch's pocket between the fingers of his right hand.

"No."

The Custodian studied Torch for a moment longer, then slipped the disc into his breast pocket. Cylara was also looking at Torch sidelong. "Very well. Your time here is at an end. To where would you like me to zone you?"

"Uh, how about back to the Mall?" Salma suggested, after a moment of shock at this abrupt dismissal.

The Custodian made a small seated bow. "As you wish, then. Goodbye."

Without further preamble, New York faded to grey, and then the Mall of the Western Hemisphere reappeared around them. They were standing in the very spot in which they had appeared when they'd left the nightclub.

"Do you believe that guy?" Clay exclaimed. "I've never seen a supervisor AI like that."

"Me neither," Torch agreed. "Bit of an attitude, though I suppose we *were* trespassing."

"Dude, he actually implied that he knew everywhere you'd been in the past three months and everyone you'd been there with. That is flat out impossible, even for the Full Sings."

Cylara was looking around them, her face white. "I wouldn't be so sure of that. Guys, look where we are."

They looked around, got the point. "How the hell did he do that?" Torch demanded, sounding almost angry now.

"I don't know," Salma said softly. "There must be like a million zone points into this Mall. And this isn't where we were when we zoned into his cyberverspace location, either, so he didn't just reverse our last zone."

"That's fucking creepy," Clay concluded. "I don't like it."

"Me neither," said Torch. Then after a moment, he continued: "You guys get all that about seeing the pattern of the whole world and spotting what was out of place?"

"Techno-mystic mumbo-jumbo," Clay said dismissively. "Nobody can see the data pattern of the whole cyberverspace."

"Yeah, but why program a custodial AI to spout prattle like that?" Salma wondered.

Cylara giggled suddenly. "Maybe so the resurrected ones that they send there will feel at home."

Clay rolled his eyes. "Well speaking of home, time to head there I think. I've had enough adventure for one day. You coming, Salma, or do you have some shopping you want to do?"

Salma shook her head. She walked up next to him and kissed him on the ear. "Nope, I'll come home with you I think."

Cylara brightened and turned to her boyfriend. "How about you? You still ready to light my fire, Torchy?" He laughed and put his arm around

her.

“Yeah, 'course.”

“Be seein' ya then, guys,” Clay said as he and Salma turned and walked away holding hands. Torch and Cylara did the same, waving cheerfully as they headed off in a different direction.

A quintillion data packets surged through the geographically distributed yet interlinked digital electronics that supported the Mall. Like pairs of sparks leaping from the heart of an enormous, incalculable bonfire, the ones tied to the two couples bore them homeward to safety, love, and rest.

Since man's basic tool of survival is his mind, the most crucially important occupation is the discovery of knowledge.
-- [Ayn Rand](#) (1981)

Chapter 9 Quantum Leapfrog

Justin zoned directly into the familiar office and simply stood looking around for a moment. Office was not really a good word for it, he decided. Laboratory also did not really suit, though it could be considered that, too. It was a single round chamber with marble floors, with a diameter of perhaps fifty feet. At three equilateral points along the outer circumference were large oval doorways, at least a dozen feet wide, that opened onto an expansive deck, which Justin knew made a greater ring around the building. A breeze was flowing through one of these openings, warm and damp. Outside he could see rain-lashed grey skies, of late afternoon darkening towards evening, and distant flashes of lightning.

Inside the room there were several groupings of comfortable furniture: padded chairs, tables, couches, rugs, floor lamps, holographic data consoles. A woman sat at a vast wooden desk with her back to him. Before her were a number of holo-screens and what looked like a 3D simulation of some type of molecular circuit, on which she was concentrating. Her dark, glossy hair hung just below her shoulders. Justin said nothing, but stepped forward casually to stand beside her chair on her right.

"Hello Justin," she said as he came to a stop, but she did not look up.

"Riksana." Justin focused his attention on the simulation presented in the central holo-screen before him. As he assimilated the data and what it represented, his eyebrows twitched upward. "Whoa. Does that work?"

Riksana glanced up at him sidelong. "No," she said with a light, musical laugh. She gave some of the equations written on a holo-datapad in front of her a rather stern look, and they rewrote themselves with modifications. The simulation swirled as it reset, then progressed forward, now being governed by the revised equations. The molecular circuit performed a

computation involving transitions between electron states and particle spins. What looked like glowing sparks irrupted from the simulated molecules and jetted outside the edge of the simulation. These, Justin knew, represented quantum state events being sent to other particles of matter which were entangled with the ones in the simulation.

“You've almost got the patterning correct,” Justin said, sounding a little bit awed.

“Yes,” she answered matter-of-factly. “It was obvious we'd need to use transverse energy waves to pattern the base matter and align it. The problem is with the entangled particles. There's a possible reverse quantum effect that causes perturbations in the circuit matter. This creates a feedback loop which destabilizes the circuit. To eliminate it, we would either have to isolate the entangled matter within an energetic null zone, or co-locate it near the circuit itself.”

“And since the decentralization and wide distribution of the network is a primary design goal—”

“Doing either defeats the purpose of the experiment,” she concluded with a nod.

“So what approach are you taking?” Justin asked, becoming slightly more animated as he focused on the problem at hand. “I see you're playing with damping functions. Do you think you can create an oscillator that—”

“No,” she said cutting off his question with a slight head-shake. “Not with a reactive, deterministic function. What's needed is a predictive damper that can compensate proactively rather than reactively.”

Justin considered this. “Probabilistic, or purely algorithmic?”

Riksana sighed. “I would hope for an algorithmic solution within the constraints of events inside the limited reference frame.”

Justin gestured toward a padded office chair some meters away and it vanished and reappeared in his hand as he sat down in it. He shook his head. “With that kind of a problem in chaos theory, you could end up with an algorithm requiring way more computing power than the circuits it's

facilitating could supply.”

Riksana turned and looked at him directly for the first time, her dark black eyes somehow aglow in the soft but angular planes of her lovely Asian face. Her expression was warm but serious. “I doubt it, Justin,” she said softly but resolutely. “There *is* a solution, a quantum formula that governs all of this. None of these events we call probabilistic are really random, we know that. There is an underlying mathematical reality that incorporates it all.”

“God does not play with dice,” Justin quoted.

Riksana laughed. “God is not a relevant concept. It is we who cannot afford to play with dice.”

He smiled. “And I suppose you need me working on the combinatorics of the perturbations in the quantum networking protocol.”

“You suppose correctly, my dear. You spend too much time with the Moshes.”

“Because I don't want to have to clean up the mess they're likely to make if they keep on with what they're doing.”

“Justin, when we can harness the computing power of the matter of this planet, it won't matter what the Moshes are doing.”

“You sometimes focus on the big picture a little too much, my love. There are many innocents at risk here. They are vulnerable even if we are not, and they are entitled to our concern.”

Riksana smiled at him fondly. “You are a truly moral man. I think I'm ready for a short break. Care for a walk in the rain?” She stood up and held out her hand, which he took.

They walked together out onto the balcony that encircled the building. Riksana's aerie was built on the pinnacle of a graceful steel spire which stood improbably out of the sea a good half a mile high. It was the only piece of land in sight; as far as Justin knew, the only bit of land designed into this virtual world. The grey-green sea below churned against the base of the spire, which stood in shallow water on a sea mount which did not

quite reach to the surface. Clouds, rain, gentle breeze, distant rays of the setting sun filtering through the haze to the ocean below. Everything was air and sea, with *terra firma* reduced to the faintest brush strokes on the grand canvas surrounding it. Everything was comfortable but functional and plain, with elegantly understated decoration where any was present at all. An Escher-like spiral design ringed the edge of the balcony, but there was no railing, only a curve thrust against the tangent of the empty air; and nearly a kilometer below that, the sea rippling with wind-driven waves.

It was in fact raining very little at the moment, only a few warm sprinkles hitting their faces as they faced upwind to look out at the vista. As usual when they were together, their minds moved into a light rapport, sharing surface thoughts, sense impressions, and feelings. There was no need to discuss the view, or the various atmospheric phenomena, or the responses that these stimulated in either of them. Being together in this place, which for them meant thinking and feeling together, was more intimate than any audible conversation or physical gesture.

“So tell me, how is Stefan's Project coming along?” Riksana asked, as they watched a slanting sunbeam pierce through the clouds near the horizon.

“The last trumpet has now been sounded for more than a thousand souls,” Justin replied somewhat impishly.

Riksana rolled her eyes. “It's not my mythic tradition, but I can't help but think that's a terrible metaphor for what the Cronus Scan actually does.”

“True. It's very Mosh. They themselves adopt it as a descriptive metaphor, and then decide that it offends them. Not very sensible.”

“But then, their entire religion isn't very sensible,” said Riksana steadily. “It boils down to God sacrificing his only son, to himself, to appease his own wrath at the sins of his people, whom of course he created as sinners to begin with. I mean, even if you're in need of something to worship, who needs a god like that?”

Justin opened his mouth to attempt a straight answer, then broke out

laughing instead. "I should introduce you to Reverend Cleary," he said with a final chuckle.

"A man whose intellectual powers are so weak that he can't escape the grip of the meme viruses which have programmed his neuro-cortex for him? No thanks." Riksana had always taken a dim view, almost contemptuous, of purely biological intelligence. And she had a point. How indeed do you convince someone whose very brain cells have been stamped and shaped by a belief system, to the point where anything out of harmony with his world view is automatically filtered out and cannot even truly register in his consciousness?

But Justin's suggestion had not of course been serious. Catching a flash of Riksana's deeper thoughts, he experienced a frisson of an immense matrix of second order partial differential equations. He turned to face her and smiled at her slowly. "I have the distinct impression, my dear, that this conversation does not have your full attention."

She looked up into his face and smiled back. "Dear Justin, you have at this moment 3.65% of my total attention."

He feigned astonishment. "As much as that?" And he leaned in to kiss her on the lips.

She became abruptly pliant in his arms and lingered over the kiss. As they drew apart, she murmured, "Four percent."

He feigned exasperation. "You're impossible!"

"No, this quantum networking problem is impossible."

Serious again, Justin shook his head. "An occasional feeling of inability is common to anyone who is accomplishing something."

Riksana sighed. "Then I need you to help me cope with my feelings of inability. If you're right about the Moshes, then we're operating under a time constraint here."

"I promise I'll make time, love," he said solemnly.

"Thanks. Let's go back inside." They walked back into the core of the tower, where soft lighting systems were already adjusting to the fact that

the sun was setting outside. Riksana returned to her simulation console. Justin stood behind her chair, and in a gratuitously biological gesture, massaged her neck and shoulders for a few moments. Then he bent to kiss her cheek.

“I’ll be back soon,” he promised softly, and zoned his avatar out of Riksana's world.

Experience has taught me this, that we undo ourselves by impatience. Misfortunes have their life and their limits, their sickness and their health.
-- [Michel Eyquem de Montaigne](#) (1533-1592)

Chapter 10

Gravity Gives a Sensational Performance

With a bass rumble, the ice began to break up and move. It fractured into slabs and sheets, some of which stood on end as they grated together. The whole mass moved ponderously toward a rounded berm layered in deep snow. The cracking spread, racing like branching lightning bolts over the frozen lake surface, away from the direction of motion. Nearer to the dam, the ice bulged downward with a groaning, crackling sigh as unfrozen water drained away beneath it.

A portion of the earthen berm holding back the ice, near the center, now began to subside lower, breaking the once-level plane of the snow-covered horizon that hemmed in the lake. As the slow minutes passed, the process accelerated. The center quarter of the dam continued to sag, until the bunching flotsam of tiny icebergs that pressed eagerly against it began to spill over, carried by the gathering current. The sheets of ice further upstream began to shudder, and threw up a shower of ice crystals, like a cloud of thick mist rising from the face of the lake, vibrated off its still surface as if trying to escape disaster by flying upward into the pale night sky.

The aurora, faintly twisting above the surrounding hills, lighted the gathering cataclysm impassively, and made gaunt, aghast spectators of the tall pines that thronged the looming ridges and ringed the trembling lake shore. Starlight flashed on sudden rents of black water, which struck out across the lake from the dying dam like dark anti-lightning on a field of white, a reverse-video monochromatic image of destruction.

The center of the dam now disappeared entirely beneath a cresting wave of liquid shadow flecked with spinning chunks of gleaming ice. The

splintering vibration of the ice swelled in a majestic, gelid crescendo as the entire lake surface began to shift visibly toward the dam, like a vast audience wildly applauding the end of a performance even as it streamed out of its seats toward the exits. The thunderous ovation began to be answered from a distance, as a wall of water and suspended ice eighty feet high blasted down the riverbed below the dam. The unexpected hit show was spontaneously going on the road.

A few clusters of geodesic buildings were strewn along the riverbank, filling a broad, level space on the upstream side of a sharp bend in its course. Grayish white or silver, even where not covered with snow, they looked like handfuls of human habitation thrown haphazardly into a pristine wild landscape. A few leafless deciduous trees arched over the paths that had been worn in the snow between the buildings by booted feet. The size of the trees proclaimed that the settlement was not new, just as the beaten tracks proved that it was inhabited. A few of the round buildings showed exterior lights, but most were dark in the pre-dawn dimness, and none showed lights from within. A couple of caribou wandering through the village on their way to or from the water abruptly froze and flattened their ears. After a moment they trotted purposefully away into the forest and uphill.

The dim rumbling grew clear, and the chattering of the partly frozen stream seemed to go silent. With terrifying suddenness the rumble swelled to a roar. A door opened in one of the buildings, and a man stood there limned in the porch light. He gaped uncomprehendingly at the abrupt apparition of what looked like a moving forest, made of spinning and thrashing trees frantically stirring a rushing horizontal wall of angry grey porridge. Then he turned and leaped back inside, the door closing futilely behind him, seconds before impact. His desperate fear lasted only those few seconds.

Waking or sleeping or jacked into the cyberverser, the carnage was total. Fountains of electric sparks and an actinic glare flared momentarily under the descending pall, as uprooted fusion generators were instantly shut down by their emergency fail safes. The erstwhile lake and its bristles of timber and rolling boulders brushed the valley as clean as if it were sweeping back time itself, to an era when there was no settlement, no trees, no grass, nothing at all but dirt and rock and frigid water.

In due course the wintry sun rose weakly above the remains of the lake. A deeper channel still held water, like a wide calm spot in the river. It wound lazily along its new banks in what had been the deepest part of the lake, toward a gap like a gateway between two earthen hills on either hand. Chunks of ice and a steady stream of sediment threatened to choke off the gateway again, but each time the river merely gathered its waters against the obstruction and pushed through it. The ice and dirt trickled over the base of the dam and down the broad, desolate path through the valley below, where gravity steered it in a meandering course amongst the unfamiliar obstacles of the river's new bed.

The gap between what you know and what you think you know is always dangerously wide.
-- [Nassim Nicholas Taleb](#), *The Black Swan* (2007)

Chapter 11

The Secretary and the Preacher

It sure sucked sometimes, having to put up with the attitude of his allies, Roger Sarner reflected. The Homeland Security Secretary was sitting in a borrowed office in Seattle which belonged to one of his undersecretaries. Across the table from him was Reverend Maxwell Cleary, whose bespectacled visage was quite familiar to Sarner, though he couldn't honestly say that he liked the man very much. Unfortunately he was compelled to treat the little weasel with the respect that his organization, if not he himself personally, deserved. Whenever he was in the same general neighborhood as Sarner, Cleary had a way of requesting personal meetings at which they exchanged updates. The KOJ had a pathological distrust of anything other than in-person communications.

"You're positive that the Sings haven't put it together, then?" Cleary asked, with his lips pursed in a disapproving, doubting way that suggested he might be disinclined to credit Sarner's competence to answer the question.

Sarner gave him a confident smile and waved a hand in a gesture of indulgence. "Put it this way, Reverend. If they had, we'd be seeing surveillance activity around the other brain houses that we've targeted. Which we're not seeing. So a street in Charleston, South Carolina collapses into a tunnel that links up with the sewers, so what? Everyone knows street maintenance schedules aren't what they were. You know how many bridges have failed in the Federation in just the last year? Hundreds. Quite a few don't get replaced these days, either. At least we filled in the street. No reason to link the cave-in with the nearby brain house. We've taken that particular one off the target list anyhow, as a precaution."

"Your reasoning is sensible enough," Cleary allowed. "Every unusual

occurrence can hardly be evidence of a plot, after all.”

“Exactly,” Sarner said nodding. Seemed he had the jittery preacher convinced at last. “And the Sings are anything but paranoid. In fact our personality profilers keep coming up with results that show most of them are overconfident to the point of being almost completely oblivious to real world events a lot of the time.”

Cleary nodded. “I'm glad to hear that we seem to be in agreement that events which plausibly look like random disasters won't attract any special scrutiny. That of course is why we simulated a natural disaster in order to determine the Sing response to a destroyed brain house.”

Sarner's mind raced. Now it sounded like the glib asshole had just been baiting him out with his concerns about the tunnel collapse, in order to make it impossible for him to disapprove of something the KOJ yahoos had done that was Outside The Plan. Something that he was now going to find out about. Sarner positively hated it when people who weren't supposed to do so displayed improvisational behavior.

“What natural disaster would that be?” he asked curtly.

“You must have heard about the old earthen dam that broke the other night during a thaw, a few hundred miles north of Vancouver?” Reverend Cleary's tone had become slightly peremptory, as if he were brusquely explaining something to a child.

“Yes, I heard something about it.” Sarner recalled scanning a memo describing the event, but couldn't remember the name of the lake, or the valley that had been flooded. “Loss of life was slight, under a hundred people,” he added, pleased to have remembered a detail he could proffer as proof. “Your KOJ bunch was responsible for that?”

“You could say so,” Cleary confirmed with a thin smile. “That is to say, nature and gravity did the work, we merely got things rolling by weakening the dam with some well-placed explosives.”

Sarner blinked at him. That dam was public infrastructure, and the KOJ had most emphatically *not* been given governmental permission to sabotage

it. Time to stop coddling the little creep. “What the hell did you do that for?” he snapped.

Cleary looked insouciantly out the window at the omnipresent Seattle winter rain for a moment or two. “The object,” he explained at last, “was to wash out what we believe was a major brain house down in the canyon, and see what, if anything, the Sings would do about it.”

Roger Sarner was dumbstruck. This was not only outside the agreed plan, it was downright irresponsible and just plain stupid. “There was a brain house below that dam?” he got out at last.

“Some miles downriver, yes.”

“And you guys destroyed it, just to see what would happen?”

“More or less. And I have to tell you, so far nothing whatsoever appears to have happened. No one has visited the site of either the brain house or the broken dam, thus far.”

Sarner was done reasoning with this jumped-up religious leader. “Reverend, that is not acceptable,” he grated in his best nonsense-free tone. “Your personnel were engaged to dig tunnels to designated brain house targets throughout the Federation. Nowhere in your mandate is there any allowance for sabotaging government property, flooding canyons, or destroying enemy brain houses at this time. In fact, it was explicitly agreed that no targets would be destroyed, or any Sings liquidated, prior to the commencement of the final phase of the operation.”

Cleary shrugged. “Well I think you can safely say that some Sings were indeed, uh, *liquidated* as you put it,” he said with a smirk.

“You're missing the point, Cleary.”

“Oh, I got the point, Mr. Secretary. You seem to have missed the point that we're allies, not subordinates. We do not, as a group, work for your government.”

“I'm aware of that. The point is, agreements were made. And signed. And it's your leadership's job to make certain that those agreements are kept, by all of your personnel. Now who was responsible for this little, um,

initiative?”

“That would be me, Mr. Secretary.”

“You? How convenient. And what prompted you to decide to deviate from our agreed-upon operating plan?”

“The fact that we have no data, absolutely none at all, on the effect of the destruction of a Sing brain house or what the Sings are likely or capable of doing about it.”

“So you just decided to experiment? Hasn't it occurred to you that by doing so you may have tipped our hand, fired a warning shot across their bow? What if they use this as a reason to build more redundancy into their network? And what the *hell* do you mean by doing this on your own initiative without so much as the courtesy of notifying your own government officials?”

Cleary sat up straighter and leaned toward Sarner, displaying some irritation of his own for the first time. He ticked off points on his fingers as he answered Sarner's multiple questions one by one. “Yes, we decided to experiment. Of course tipping our hand occurred to us, but as we just now discussed, a disaster which appeared random and natural did not seem likely to do that. Third, we think they have plenty of redundancy designed in already, and wanted to gain some insight into how much by seeing whether they rebuild the site or attempt to recover anything from it. And lastly, Roger, what the *hell* makes you think I actually need your permission to do anything in the first place?”

Sarner bit down hard on his temper. God he wanted to kick this little prick's ass right now. But there were other things he wanted more. “My office is part of the legitimately constituted government of the North American Federation! As such—”

“As such, your office has no business plotting the deliberate destruction of the property, to say nothing of the lives, of its own citizens. Why do you think you've been using our KOJ “personnel” to do most of your dirty work, quite literally? Because your people can't be seen doing such things in

case they get caught, and because you simply haven't got the manpower. So don't come on with the "official" crap to me, Roger. Nothing you've been doing with us is official, nothing at all."

"Most of what goes on in the brain houses is illegal," Sarner returned hotly. "Whenever *we've* destroyed one, it's demonstrably been in the course of proper law enforcement."

"Try using that as a justification to sniveling collaborators like Robert Reynolds! You know as well as I do that your own superiors would disown you in a heartbeat if they knew what you were up to with us."

"And you should know as well as I do that those idiots won't be in charge much longer!"

Cleary shrugged and spread his hands on the table with studied nonchalance. "Okay, so add plotting a coup to your list of official misconduct. It's all the same to us. We don't consider any government legitimate that derives its powers from a secular source. Legitimate government has to be ordained by God."

"Ordained by you, you mean," Sarner said with a bitter sneer. He could see where this was going. Someday Cleary hoped to have himself anointed pope and crowned king to boot.

"Through me, perhaps, but not by me," came the smooth reply.

"I don't see the difference."

"I didn't think you would. Now, if you've quite gotten all that out of your system, Roger, perhaps we can return to business. My man on the inside has been able to confirm the existence of virtualities that are intended to house the Last Trumpet simulacrums. In my opinion, we should be monitoring for increased transmission bandwidth or new nodes that may indicate dedicated brain houses coming online. Do you concur?"

Sarner fumbled for a moment, caught off guard by the question. He quickly toted up his options. To accept the change of topic would be to agree implicitly that the KOJ could act independently without advance permission. But it seemed that pushing Cleary on that issue right now

would not be a productive use of his time. And although Sarner didn't like to admit it, the fact was that Cleary was basically right. The agreements they had drawn up between them were unenforceable because they could never be made public. To do so would implicate them both, but would hurt Sarner himself much worse than Cleary. To say nothing of scuttling their entire plan, which was far too important to risk pursuing a personal quarrel. He decided to let it go and feign tolerance until his position had improved. Someday after all there was going to be a new government, a strong government, and he, not Maxwell Cleary, was going to end up at the top of it.

“Um, right. Our people's best guess is that since the Last Trumpet folks come back as Full Sings, they'll end up getting hosted on the very fastest hardware in the same brain houses as the other Full Sings. So we look for existing high-traffic mesh nodes that suddenly spike up in bandwidth.”

“Very good. And you have your people on that monitoring task already?”

Sarner forced a grin. “Ferret is all over it.” This was one area where he knew he had the upper hand over Cleary's bunch. Their own religion essentially forbade them to have anything to do with high technology, so monitoring the worldwide mesh was hardly their forte. Nevertheless, somebody in their Order was obviously being permitted a wide latitude with hypocrisy. Cleary had never been very forthcoming about his “man” planted on the Sings, but he was plainly a very advanced Sing himself. Promised a full pardon for his sins, no doubt.

“Excellent. You will let me know if there are any new targets we should add to the Dig Here List?”

“Sure. And, eh, you will let me know if you're going to dynamite any more earthen dams?”

Reverend Cleary emitted a short, barking laugh. “Okay, why not? Deal. But I don't think we'll need to conduct but the one lone experiment.”

“Well thank God for that,” Sarner replied in a light, casual tone that was freighted with not quite enough sarcasm to elicit objection. “Is that about

all we had, then, Maxwell?”

“Suits me, Roger.”

“My assistant will see you out then, hope to see you again soon.” Both men stood to shake hands, with the good-natured enthusiasm derived from hatchets buried if not blunted. Roger Sarnier turned and made his way back into the outer office for some further consultations with his staff in this regional office, which he visited only infrequently.

Maxwell Cleary watched him go without regret. *He's a clod, and a brutal one at that*, he reflected. Men like Sarnier were among the worst that entered public service, and they had a disconcerting way of rising consistently to positions of prominence. Sarnier was an empty man who ultimately believed in nothing but power for its own sake, and sought after authority mainly to legitimize and satisfy his own predilection for domination and violence. But at least he did clearly perceive the evil of the Sings.

Please God, let him keep his hostility focused where it belongs for just long enough until it won't matter anymore.

We'll take a cup of kindness yet, for auld lang syne. -- [Robert Burns](#) (1788)

Chapter 12
New Year's Eve

This year's coolest New Year's Eve party was in Vokyo. The virtual city of Vokyo, like the ancient meatspace metropolis which had inspired its design, was an enormous and complex city that was home to millions. For tonight, in honor of the special occasion, it would play host to a guest population that was expected to top one billion. In order to accommodate such a vast number of virtual avatars, the city would be instanced about a hundred times over. An instance was a homeomorphic copy of the geometry and NPCs of a virtual space. Various groups of commercial sponsors were underwriting the hosting costs for the twenty-four hour period – twelve hours either side of midnight, Tokyo time – for which the multiple parallel instances would be online. The event was being glibly promoted, with some credible justification, as the biggest New Year's party in the history of human culture.

Salma Rivera stood in a posh hotel lobby holding hands with her boyfriend, Clay. In addition to the ordinary pleasure of holding hands, doing so also provided some practical utility in that it prevented them from being swept apart by the streams of fellow travelers that were using this hotel as a jumping off place for travel to Vokyo. The hotel was Bavarian in style, ornately white and gilded, though much more brightly lit than an eighteenth century original would have been. But then, no Bavarian hotel would have boasted a Tokyo subway entrance just outside its front doors, either. A stream of guests poured down the grand staircase from rooms above, or up the smaller flights of stairs debouching from the elegant shops situated below, and flowed out the hotel's doors, or else milled around on the polished hardwood lobby floor as Clay and Salma were doing.

Clay gestured at a couple descending the grand stair, and Salma smiled

and waved. Cylara waved back, she and Torch spotting them at almost the same moment. Cylara looked extremely elegant in a full-length silk kimono of a warm jade green color. She seemed to float down the staircase, the twinkle of her feet taking the stairs obscured by her clothing. Torch was caparisoned like a Samurai, right down to a pair of curved swords. He had darkened his hair to a dark brown much more in keeping with his costume, looking like a stern bodyguard proudly escorting a great lady. Salma and Clay had gone nineteenth century Spanish with their dress, with plenty of lace and ruffles.

“Wow, what a crush, huh?” Clay said as the two couples met near the center of the room. The men shook hands and the women embraced briefly and complimented one another's outfits.

“It's crazy,” Torch agreed, shaking his head. “I didn't expect this place to be so busy.”

“Me neither. Well, shall we get going?”

Both couples clasped hands and strode toward the open doors. Outside was a rendition of a downtown street in a German city, late afternoon on a warm spring day, very picturesque, complete with horse-drawn carriages, carts and well-dressed, bewigged pedestrians – and the amusingly glaring anomaly of a tube station entrance at the edge of the street facing the hotel. Gauche neon lettering over the top of the arch advertised “Orient Express,” automatically rendered in each individual beholder's preferred character set and language. A down escalator stood just inside the arch, and with an appreciative chuckle, the four friends stepped onto it and descended under the street.

“Let's hope there's no murder on this train, Agatha,” quipped somebody ahead of them.

Beneath the street was a broad platform that fronted the subway tracks. Even as they neared the bottom of the escalator, an empty train pulled to a stop along the edge of the platform and opened its doors. The crowd that had gathered on the platform began moving onto the train, but in a leisurely

manner quite unlike the traditional Tokyo rush-hour style. The foursome moved toward a car that wasn't full yet, so they'd have a spot to sit down together. The train resembled some late twentieth century model.

The doors closed (without anyone stuffing yet more passengers bodily into the cars; there were some touches of historical verisimilitude which were best omitted by simulations) and after a moment the train began creeping forward. As it left the station it picked up speed, sliding smoothly and quietly along its tracks.

Abruptly the dark tunnel opened into a brilliant sunlit space. The train, moving ever more swiftly, sped along a ribbon of track laid along the edge of a bluff overlooking a pristine white beach that bordered on a calm, turquoise sea, over which the sun was rising. As it continued to pick up speed, the train altered form into something more closely resembling a French bullet train than a Japanese subway. The tracks swept gracefully to the left along a promontory bluff, well banked to cope with the G-forces, which pressed them gently back into their seats. Then it plunged into another tunnel, bringing darkness punctuated by the flicker of passing light panels and the rush of speeding air.

"Scene change!" said Cylara with a light laugh. It was so obvious, but enjoyable nonetheless. This time the train didn't change, the tunnel did. Suddenly it resembled the Chunnel under the English Channel, though traversed at a breakneck above-ground velocity. Continuing to accelerate, their train vaulted up and to the right, and emerged into daylight again. It now sped at what had to be near supersonic speed along tracks laid at the very surface of a calm ocean, straight into the orange ball of a rising sun. The rush of their passage grew to a roar, and the train's vortex sucked a wake of glittering spray behind it half as long as the train.

The four of them exchanged delighted glances. This gratuitous scenic approach to what was nothing but a glorified zone point was unexpected, but nice. The event promoters were obviously out to make it memorable. The next tunnel appeared ahead as a vast whirlpool into which the tracks

swooped and disappeared. A film of water hit the windows with a slight jolt as the train dipped into the maelstrom.

After a heart-stopping moment of total blackness, the train transitioned onto a track that still ran straight toward the rising sun, but now extended, miraculously unsupported, through clouds blushing pink and ocher with the dawn. The earth was an invisible blur below as the train broke the sound barrier. As if adapting itself to supersonic travel, it became ever more streamlined and futuristic, a carbon nanosteel frame and glass skin replacing the weaker twentieth century materials. Holographic light pulses streamed like heat from the nose of the train and ricocheted around the sides of the cars within their translucent panels. As soon as one focused on the lights, their message became readable: "The future is now."

"If the rising sun represents Japan, I wonder if we'll reach it?" Clay offered.

"It's supposed to be a hot party, but probably not quite that hot," Salma replied, getting a general laugh from those near them.

Without preamble, the train executed a leisurely spin on its axis, and as it completed its revolution the scene outside changed, like rolling up a shade covering a window. Now they had corkscrewed into a reality that was purely abstract. The track became a mere pulse of light, traversing a black and fathomless void in which there was nothing, neither land nor sea nor sky nor even any stars. The sun's disk was blotted out as if in an eclipse, leaving only a fiery corona that starkly lit the scene. The light pulses down the train's translucent skin began to shift into spectra as they approached relativistic velocities. The letters formed by the pulses had changed, yet were still visible as the spectral shifts appeared to flow through them. They read: "Celebrate the Singularity!"

It now seemed clear that their true destination was not the sun, but the event horizon at the edge of the sun's disk, which they would presumably reach just as they achieved the speed of light. The symbolism was appropriate, and even strangely moving. The imminence of impact, of

arrival, of fulfillment, created a moment of tense anticipation even for the most jaded of passengers.

There was a soundless starburst of every shade of light at once, a faint wrench, and then they were coasting calmly down a track within a glass tube, one of many which radiated from a common center like wheel spokes, or the limbs of a monstrous tinker-toy, toward a ring-shaped starport spinning in orbit over what was, unmistakably, Japan under the terminator. The design of the starport was similar to a representation of a complex molecule, as if their passage over the event horizon had somehow brought them down to the atomic scale. Each spoke ultimately connected up to the orbiting station's outer ring, but at a different place – corresponding, no doubt, to the particular instance of Vokyo into which they would zone once they got there. Other trains could be seen traversing their own tubes as they braked to a stop along different segments of the ring.

Their train slid smoothly into its berth in the starport and came to a complete stop. The doors opened, and the passengers came to their feet. Quite a few applauded as they walked off onto the platform, which once again looked incongruously like a subway station. Viewer-dependent neon lettering over the exit arch read “Thank you for traveling the Orient Express,” alternating with “Have a Happy New Year!”

As they rode the escalator up to the streets, which zoned them to their chosen instance of Vokyo, Torch opined: “*That* was cool.” The others agreed, and walked out onto the bustling street, eagerly looking forward to an evening spent sampling the varied night life for which this virtual city was justly famed.

The joyous multitudes, representing races and cultures from all over the world, had their complete choice of entertainments. By mutual agreement, the two couples opted for some fine dining, followed by a theatrical presentation. The great thing about dining with virtual avatars was that one never became hungry, or satiated, or drunk, or sick, unless one deliberately chose to experience such reactions. It was all about the

sensuous experience of eating and drinking, and the social experience of doing it together.

After the play, they traveled partway across town to patronize a sushi bar which was one of Salma's favorite spots. It was particularly suitable for tonight because it had a large open patio on the eightieth floor which would command a fine view of the fireworks that would shortly be lit off a few blocks away. The place was busy, but they were able to get a table out on the patio. The weather was of course perfect, indeed unusually warm for a December night, and the city lights emanating and reflecting from neighboring buildings flooded the patio with a warm, subtle but variegated multicolored light, not unlike the lighting effect produced by a Christmas tree in a dark room.

As they put in orders for their favorite sushi rolls, Salma noticed a few familiar faces sitting at a neighboring table. Although she'd been to this very club with these people on a number of occasions, the coincidence was somewhat remarkable given that tonight, this was only one of about a hundred instances of this particular place. One of her friends noticed her at the same moment, and waved.

Several minutes of introductions and handshakes and social niceties necessarily followed, as Salma introduced everyone who had not met before, and the separate tables were pushed closer together. One woman, a slim redhead named Jenny, did not have a date with her tonight. Which was unusual, considering that the last time Salma had seen her, Jenny had been with Salma's cousin. Jenny's responses to greetings were somewhat subdued, which made Salma wonder what had happened. But she certainly wasn't going to ask Jenny about it directly.

Instead she got the attention of one of the men seated closer to her, and asked him. "So, where is Arturo tonight?" she inquired, *sotto voce*. The man shot her a curious look, then a somewhat pained one.

"You don't know?" he replied softly.

"No, I'm afraid I don't. That would be why I asked."

He faced her more squarely, spoke steadily but quietly. "Arturo couldn't be here tonight. He's dead."

Conversation dropped off as the words registered around the two tables. Salma found herself gaping stupidly.

"Dead?" she queried, hoping this would turn out to be some joke.

Jenny was now looking straight at her. Salma met her eyes, saw pain reflected there. Jenny nodded her head ever so slightly.

"He was caught in a flood when a dam broke in British Columbia," the man continued. "Killed instantly. I'm sorry."

Salma nodded, feeling loss but also a touch of shame because the man had been her cousin and she hadn't known about a death in the family. "I'm sorry for your loss," she said across the table to Jenny.

"Likewise," Jenny returned, then dropped her eyes to the plate before her, where some sushi chef's concoctions stood untouched, toothpicks projecting upward awaiting grasping fingers.

"Well that news sort of puts a damper on the evening," Torch commented, but in a lighthearted tone. Jenny looked up sharply.

"No, please don't let it do that."

Salma also shook her head, and breathed her own soft denial. At that moment some sake arrived, and one of the men in Jenny's party took the opportunity to propose a toast.

"To the future, and to friends present and friends remembered." Glasses were raised and clinked together all around. It was nearly midnight.

From somewhere the plaintive strains of Auld Lang Syne began to play, in a fitting tribute to west coming together with east under the brilliant night sky. Some hummed, some sang along, some merely sipped their sake. Only seconds after the final verse ended, the fireworks began. The view from this location was spectacularly unobstructed.

Any display using fireworks which were unconstrained by material physical laws took on a different character from purely traditional fireworks. Not all of the effects and components were ballistic. Some

followed Newtonian trajectories in an obvious homage to fireworks of the chemical kind, right back to the Chinese invention of the art so many centuries ago. Others blatantly defied gravity, or progressed backwards from a full flowering display down to a single silent point, shrinking instead of expanding. Colors were mixed with sounds and a color palette employed which would have been unachievable through chemical combustion. It was part laser light show, part abstract art, and partly a barrel-chested instantiation of a traditional display. It was all superb. The designers had outdone themselves.

But the real surprise came when the starport orbiting above the city contributed an answering barrage of simulated meteors and comets, which descended toward the earth like the onset of Armageddon, only to disintegrate into sparkling dust in the lower troposphere. That was the finale, and it got a cheering, stomping, standing ovation from a good billion dazzled human intelligences. The fearless blending of aspects of traditional culture with Singularity technology was lost on no one. The future was indeed now, and all things lay within human reach.

As the applause died down, and people hugged and laughed and drank more toasts and wished one another Happy New Year in a dozen tongues, Clay became smitten with an audacious notion that took shape in his mind like an exploding firework.

“Look, everybody...” he began, gesturing for the attention of those around him. The others thought he was about to propose another toast or something and accorded him their polite interest. “Now this is the future, right? It's the Singularity. And the Singularity is all about removing the limitations of the past. One of those limitations is death. Well, enough feeling loss and grief already. Why should we have to accept that Arturo is dead, and isn't coming back to us?”

There was a brief, eyebrow-raising silence. One of the men, a British chap who'd sung Auld Lang Syne passably in its original Scottish dialect, saluted Clay with his sake glass. “If you're talking about putting Art's name

in for the Last Trumpet Project, old man, we've already done that. But the line's rather long right now, mate, and there's no telling when—

“No doubt, but I'm personally acquainted with Stefan Jager himself,” Clay interrupted. Heads turned. “Not to be a name-dropper or anything, but it's true. I did some work for him once.” Torch gave him an incredulous look, as if to say: “Why didn't you mention this before?”

“And you think you could get the request expedited?” Jenny asked excitedly. Clay finished his sake and set down the tiny glass.

“I think it's certainly worth a try.”

Salma beamed and stepped close to him. “I agree. I'll go with you. I don't want this to be true. I don't want it to stand, that my cousin is dead.”

“Who would?” Clay asked, and gave her a quick kiss. Jenny came over to express her gratitude, and gave Clay her contact information. The gathering continued, as people milled around the tables striking up new conversations on more neutral topics, sampling sushi off of platters, ordering up more drinks. Before long, they would break up the party and begin to head homeward.

The echo of the orbital fireworks seemed to linger in the mind's eye, like a flaming challenge flung against the night sky, against fate, against the darkness of the past.

If every instrument could accomplish its own work, obeying or anticipating the will of others, if the shuttle could weave, and the pick touch the lyre, without a hand to guide them, chief workmen would not need servants, nor masters slaves.

-- [Aristotle](#) (384 B.C. - 322 B.C.)

Chapter 13

The Jaded Goddess

Cylara Janovic willed herself awake, deactivating the sensory interface bypass on her nanocomp neocortex. Virtual reality faded as the input feed from her biological senses took over. Her eyes opened, and out of habit she took a shallow breath. She was floating in a sleep capsule filled with an aqueous solution, buoyed up by the smart skin which encased her body like a wet suit.

“Drain for emergence,” she said clearly, and in response to the command, the fluid level in the tank-like chamber began to drop. Shortly her supine form came to rest on a soft platform like a mattress, above which she had been floating. She stretched and flexed her fingers and toes. Virtual bodies didn't feel noticeably different, but there was still something satisfying about feeling the sensory feedback from her own.

The drained capsule opened to one side, and she swung her legs out of bed and stood up. She experienced no dizziness, despite the length of time she had been recumbent. The capsule bed stood at one side of her bedroom, with a more prosaic four-poster king size one situated opposite to it. The door to her huge walk-in closet stood open. She walked over to it and stripped off the smart skin bodysuit she had been wearing, hanging it up carefully. There was a full length mirror on the door, which she faced.

Cylara would be forty-three this year, having been born in the year 2002. The body in the mirror looked a very athletic twenty. Perfect proportions, flawless skin, excellent muscle tone. Fashion model good looks. She spent a few moments twisting around in and out of profile, studying her image intently. She had left instructions for the suit to stimulate enough fat cell growth to add another centimeter to both her breasts and her hips. Now that she could see the results, she wasn't entirely sure whether she liked

the effect or not. Oh well, it was a micro-optimization anyway, and in truth it had been several years since she had experienced a romantic encounter in her biological body.

She had been in her immersion capsule continuously for almost seven weeks. During that time she had visited hundreds of virtualities, for work, play, romance, even rest. There were times though, when she needed to check in with meatspace reality. Although the suit kept her clean, fed, and even shaved where she wanted to be, she still took a nice long shower by way of waking up and acclimating to her body again. Briskly selecting a set of garments from her closet, she was soon dressed casually and comfortably. She paused a moment in front of the mirror to set the color palette values on her outfit to a combination that looked aesthetically pleasing, then turned to the far wall, drew another breath, and spoke to it.

“Window, true vision,” she said. A section of the wall became a window, letting in the natural light from the exterior of her house. The view showed a late afternoon sky, a bit leaden with tattered low clouds, interspersed with some blue patches. The grounds outside the house looked damp, but it did not appear to be raining at the moment.

She strode down the hallway from her bedroom, which led to a landing, where she descended a short carpeted stairway down to a larger living area. A holoscreen was already active at a table, with a steaming mug of creamed coffee fixed just the way she liked it, in the dispenser nearby. Cylara sighed as she picked up the coffee and sat down at the table in front of the screen. As she did so, a face not unlike Cylara's own appeared in the projection, shown seated against a background that looked like an office.

“Hello, Paia,” Cylara greeted the apparition.

“Hello, mistress Cylara,” came the response, which seemed actually to emanate from the hologram image as its lips moved. The voice was a little darker and less expressive than Cylara's own, but did not sound artificial; more like that of a very businesslike young woman with a job to do. “Are you well?”

“Very well, thank you. What's the news? Did I miss anything?”

“I have prepared a briefing report on world events which you may have missed during your immersion period, grouped according to scientific, cultural, and economic headings, as you specified. This is in your news folder when you are ready to review it. You have received thirty-seven personal contacts which were not junk yet did not meet your criteria for forwarding to you in real time. On the business front, I'm pleased to report that last quarter's royalties topped an aggregate of one million copy instantiations for the first time. This has moved our search presence to the next level in several distribution channels, which does appear to be stimulating further sales.”

Cylara was, among other things, a fashion designer. Digital specifications of her designs for clothing and accessories were made available in a large number of virtualities, and whenever someone selected one of her unique designs, a micro fee was collected as a royalty. Good virtual realities were detailed and complex, and even the most accomplished world designers weren't always capable (or terribly interested) in providing their own best-of-show accessories for items like clothing, transport vehicles, tools, weapons, foodstuffs, buildings, equipment and accouterments of all descriptions which might be used by visitors to that particular cyberspace world. So as a rule they sub-contracted such accessories out to specialist designers like Cylara, who distributed their digital property for sale through a network of marketing channels that acted as middlemen, matching up the needs of virtual spaces with the products available. Open and voluntary digital data specification standards ensured that an outfit Cylara had designed would look and feel the same in any virtual world which supported the standards. Which in practice was almost all of them, although custom closed specification worlds did exist.

As with anything else, competition and market pricing determined just how much of any particular virtual good or service was required. Cylara employed Paia (her customized Personal Artificial Intelligence Assistant) to

monitor sales and track the demand and prices paid for different articles of apparel, across a whole matrix of cyberverses virtual realities (or virtualities, to use the colloquial term). Sometimes the highest return for effort involved creating a very popular item widely used in many virtualities, or in a few extremely popular ones. Sometimes it involved designing specialty items which filled a low volume niche in marginal virtualities.

In the interest of efficiency, Cylara tried to supply items which she enjoyed creating and which also addressed a currently existing market opportunity. Since virtualities themselves fluctuated in popularity, and therefore in their access pricing, and new ones were always being deployed, the global market was in a constant state of flux. Even Paia's very sophisticated demand projection module which utilized chaos theory algorithms didn't always get it right – possibly partly because so many other market players likewise employed similar market modeling techniques.

These sales figures were definitely good news. Although Cylara made a modest income from her work, significant brand name recognition had always eluded her, and such recognition was more or less a requirement for vaulting up to the next level of success. “Excellent, Paia,” she breathed softly over her coffee. “How are profits?”

“Rising along with sales. A directive is now required on whether to purchase expanded computing cycles today, or purchase more leveraged options on future cycles.” This was basically a trade-off between current consumption and larger deferred consumption in the future. All of the software that Cylara ran, from the climate control and self-maintenance programs which kept her house heated, cooled, cleaned, and its grounds immaculate, that kept her alive and safe and healthy while she was virtually immersed, and made her coffee when she got up, to Paia and her business operations, to the computing power she needed in order to run the client side of the virtualities she accessed, all needed to be hosted somewhere. Much of that was run on hardware installed here in her own home. The remainder of those cycles were leased or purchased elsewhere, and

accessed at light-speed via a seamless wireless network. All of that computing power and network bandwidth had to be paid for, along with eventual upgrade costs as the technology evolved.

Paia put up a graph, offering a recommendation. She was proposing a small increment to their wireless bandwidth budget, which would provide them with approximately fifteen percent more throughput and a twenty percent higher burst level. Along with that would go another modular CPU for their main house server, and an upgrade to Paia's econometric module. There was also a slated expansion to their offsite data storage, which was showing eighty-seven percent utilization.

On the investment side, Paia was proposing the addition of two more futures contracts to Cylara's portfolio. Both of these involved companies that were developing promising, if speculative, new technologies. One was growing diamondoid circuitry in a zero-G environment on its own satellite positioned at one of the Lagrange points, and the other was developing cold computing CPUs on the floor of the Indian Ocean which were powered by the motion of deep ocean currents. The former company was anticipating breakthroughs in quantum networking which would render their space-based computing cycles accessible for real-time applications, while the latter pursued a vision of growing quasi-organic computing hardware across the ocean bottom, rather like a deep water subspecies of coral.

Both companies' methodologies were proven, but the amount of useful computing cycles which the projects of each would produce, relative to the cost of standard technology, was still very unclear. This was why, to raise capital, the companies sold futures contracts for very large numbers of computing cycles to be delivered by specific dates. The market priced the value of those contracts according to its estimate of the likelihood of successful on-time delivery. Right now Paia's modeling was suggesting that the current price of those contracts was lower than their probable actual value.

Cylara pondered for a few moments, accessing some of the networked

computing resources available outside of her own head as she studied the supporting data behind Paia's choices. "I like your resource allocations, and will approve them with one exception," she said at last. "I think we can skip the offsite storage upgrade. I'll spend some time going over the files. I'm sure there are some things we can delete to make more room."

Paia's image nodded. "Very well, mistress."

Cylara took another sip of delicious coffee. Her body was imbued with metabolic nanobots that supplied all of her cells with the precise balance of nutrients which they required for optimal function, right down to phytochemicals and trace minerals. Her body's energy was provided by microscopic hydrogen fuel cells. As a result, she only ate or drank – coffee or anything else – for the flavor and warmth and scent and texture of what she consumed. Elimination nanobots would ultimately dispose of the coffee. "And how's the mining project going?"

"Projected yields are low thus far, but much of the property has now been mapped," Paia replied in her brisk, efficient tone.

"Good. You know, I think I'll take along my coffee and have a walk around outside. Where's the miner bot at the moment?"

"On the east side of the lot."

As Cylara stood up from the table, Paia's holographic facial image detached itself from the screen, floated over next to Cylara, and took on a complete human form, albeit one that shimmered slightly, especially when looked at indirectly. Mobile holograms typically didn't look totally convincing, but it was handy to have Paia be able to provide a visual reference point as they continued to interact over her audio link.

Cylara strolled through the living room and over to the front door, which unlocked itself and swung open in response to her voiceprint. Her front porch was fronted by rhododendrons, yews, and other perennial and evergreen shrubbery, though none of this was flowering since it was January. The manicured lawns were neat and green. The air was cool but not uncomfortable, damp but not quite misty. A faint breeze blew, stirring

in the tattered brown leaves still clinging to the large oak tree which graced her front yard. She walked slowly around the house, noting the condition of the plantings and the exterior of the house.

“Has there been much snow?”

“Less than five inches total so far this season,” Paia replied immediately. “Overall precipitation has been eight percent above normal. Temperature has varied within normal ranges.” Pretty typical for a winter in western coastal Washington.

Paia indicated that the mining robot was presently in the backyard, actually in the woods in a corner of the lot just outside the grass border. Cylara walked that way, with the glistening hologram beside her. Paia's image was being generated by a small hovering projector, but this was disguised by its being contained within her holographic body space. The projector's audio and video interfaces were connected via a wireless network to Paia's software running on the house CPU.

The mining robot was a boxy oblong grey thing with six deep-treaded wheels, like a miniature ATV, about five feet from end to end. It had a number of utility arms, sensors, drills and such mounted on top of it, which could swing out over the ground. This particular type of robot was actually a portable nanobot colony rather than a robotic digger. It drilled holes only to deploy billions of microscopic nanites which moved through the soil in search of whatever minerals they were programmed to find. Rather like an army of tiny ants ferrying food back to their nest, the nanites locked onto particles of the desired minerals and dragged them back to the bot for collection and storage. The robot's AI controlled the nanites using a dedicated wireless network.

Cylara had instructed it to quarter her entire property gradually, performing spectrographic analysis of core samples from different depths to deduce where best to deploy the nanites, which were then sent down to map out the overburden in minute detail. It was capable of recharging, repairing, and even replacing its full rated complement of nanites, so that

its operation could continue indefinitely, so long as its fuel cells lasted and raw materials were supplied. This particular model had cells which were rated for up to five years of continuous use, and a lot of the materials needed could be recycled or obtained via its own mining efforts.

In the interest of efficiency, the robot's initial task was to map the property thoroughly, from the surface down to a depth of about thirty feet. The nanites could be operated even deeper, but due to their extremely slow travel speeds, greater depths quickly became impractical. Paia informed her mistress that the mapping project now stood seventy-two percent completed after the nearly ten weeks of operations thus far. The robot periodically uploaded its results to its control software on the house computer, where Paia kept track of it.

Because the robot's nanites had sifted through so much of the overburden on the property at such a fine granularity, they now knew the location of every bit of commercially valuable mineral over nearly three quarters of the subject area. Once the mapping was complete, the AI control software would analyze the data to design a mining program which would maximize value recovered per unit time, and download it into the miner bot.

When the robot had accumulated an economically meaningful weight of a particular mineral, it would send a signal to the company from which Cylara had leased it. They would dispatch a specially equipped pizza bot to link with the miner, upload the recovered minerals, and transport them back to the company for processing and eventual sale. The value realized would be split between the mining company and Cylara, as per their agreed contract. The robot essentially earned its manufacturers a commission on the client's minerals.

"This property is not especially mineral-rich, but as you can see there is enough recoverable iron, gold, and silver alone to make the operation economic," Paia reported. Cylara was studying, on her heads-up retinal display, 3D colored graphs created by the bot depicting the density and

location of discovered amounts of those and other minerals. She could readily see that Paia was correct. In fact, it looked a little better than she had been expecting.

“What's the production timeline projection?” she asked next.

“Assuming that the remainder of the property roughly conforms to the distribution seen in the first seventy-two percent, the mining program will remain profitable, at current market prices, for approximately three years. After that time the operation will be marginal for up to an additional two years.”

“Hmm, better than we hoped.” This deal with the robot mining company had looked like such a no-brainer that Cylara had actually been suspicious of it.

“Indeed, mistress.”

“Make sure that the gold and silver ends up in Aurumnet.”

“Confirmed,” Paia said with a nod.

Aurumnet was an anonymous, decentralized network for monetizing precious metals, especially gold. It operated as a private distributed mint which produced digital coinage. Those who had physical precious metals, like Cylara, could offer their metal to Aurumnet. Customers identified themselves via their personal control of unique, quantum encryption keys, and using these, submitted the details of their request. Aurumnet's AI would turn the prospective client over to a fair witness in the client's area, who would make arrangements to inspect and take possession of the metal. The fair witness provided a certified data block attesting to the weight and fineness of the metal inspected. The metal itself was then transported to a warehousing location, one of many thousands around the world, each containing relatively small amounts of metal, controlled by a bailee chartered by Aurumnet.

Once the metal was safely stored by the bailee, Aurumnet would mint unique digital coins corresponding to the weight of the metal, less a small minting fee which paid for the services of the fair witness, the bailee, and

the Aurumnet mint itself. Those digital coins then became messages encrypted to the client's public key. Anytime Cylara wanted to spend her coins, she could do so by generating a digitally signed and encrypted axiomatic token and sending it back to Aurumnet, specifying the public key of the party to whom she wished to surrender the digital coins. Those were then re-issued to the new holder by the mint network, encrypted with the new holder's unique key. Any leftover change would be re-minted and returned to Cylara. Naturally, electronic wallet abstractions overlaid these details for everyday use in the global cyberverspace marketplace, so that spending was as easy as shaking hands, sending a private message, or handing over a coin.

Aurumnet employed an AI auditor which monitored and balanced the aggregate metals holdings at all of the bailees versus the sum of all circulating digital coins, continuously in real time. It also utilized physical auditors who randomly double-checked the bailee holdings at warehouses and the reports of fair witnesses for accuracy. These physical auditors received bounties on any discrepancies which they documented. The metal holdings were individually insignificant and scattered all over the world. The bailees, fair witnesses, and auditors were all kept anonymous, authenticated via encryption challenges against their keys posted on the Aurumnet keyserver.

The Aurumnet network itself was highly distributed so that its data stores and control logic were spread across computers around the world, with the pieces migrating from one host system to another at random intervals and communicating only via unbreakable quantum entanglement encryption. Because of these features, the system was believed to be impervious to effective attack. Losses due to fraud or counterfeiting had never yet risen to anywhere near one percent annually; a much better record than any other currency in human history. No criminals, whether internal or external to Aurumnet, in the private sector or the government sector, had ever managed to compromise the system.

Aurumnet did of course have a number of competitors that performed similar services with gold or other stores of value. In a free market for money, it was merely the largest and best known currency issuer. Which was why Cylara wanted to bail her gold into its system.

Back in 2036, when researchers at the Solomon Institute for Quantum Physics had proved and patented their techniques for subatomic reconfiguration, it technically became possible literally to create any element out of smaller atoms and subatomic particles. The discovery had temporarily caused a sharp drop in the market price of gold relative to other commodities, based on the anticipation of future inflation in the global supply of the metal. But since Au79 is a relatively heavy element, it turned out that the amount of energy and effort required to synthesize it from base particles essentially ate up most of the value of the gold created. At that point the price rebounded, eventually finding an equilibrium point where the cost and difficulty of obtaining more gold equaled the cost and difficulty of obtaining other goods priced at an equivalent weight in gold.

Cylara's mining venture was not going to make her rich, but it would provide some supplemental income over time. Nodding at the miner bot as if to say "carry on," she sipped some more coffee and continued her stroll around her house. Paia followed.

The house sat on about six acres, of which a bit more than half was fully landscaped. After nearly twenty years, the plantings had become fairly mature. In the seven years that Cylara had owned the property, she had made only modest changes and additions. She no longer found herself interested in making any. In fact, as she walked around the dwelling on this mild early January day, something about the entire scene struck her as depressing.

What, after all, was the point of having a nice house out in the country which you seldom visited, and that was in any case vastly more humdrum and prosaic than most of the virtual locations where she normally spent her time? She could live in a palace if she wanted, or a fine hotel. She could

live in an underwater city or a space colony on another planet. Anything in real reality, no matter how nice you tried to make it, was going to look dumpy and dull by comparison. These days all she could bring herself to do was provide for the necessary upkeep to prevent decay, because that really *would* be depressing to wake up to.

Not for the first time, Cylara wondered why she bothered to wake up at all. Her life was almost entirely situated in the cyberverses these days. She designed her products in her virtual workshop, not in the studio in this house. Her recreational time was spent in a thousand places, just as the whim took her. Even her relationships were in the cyberverses. She visited family and friends regularly, but hadn't seen any of them in the flesh in years. And then there was Torch, her current boyfriend. She felt a growing and profound attachment there, despite the fact that they had never even met in person. She didn't know for sure how old he was, where he came from, or what he looked like. Nor, she was sure, did he know those things about her.

She stopped and took a seat on a stone bench near one of her dormant flower beds, drained off the last of her coffee and set the mug beside her. She clasped her arms around her body, feeling a sudden chill. It was not, after all, all *that* warm out here. She felt the warmth of her own embrace, and reflected that it really didn't feel any different than the same action would in a virtual body. She took a deep breath of the damp, loamy cool air, and let it out slowly. The respirocites in her lungs and bloodstream would process that single breath so efficiently that she could go without drawing breath again for several hours if she wanted.

Nanobots embedded in her body's muscle tissue gently exercised every muscle in her body even when she wasn't using them. The result was a perfect tone. Monitoring sensors woven right into her clothing scanned continuously for tissue damage, microbial incursions, even cells dividing with imperfectly copied DNA. Any threat to the integrity of her body's trillions of cells was immediately detected and remediated by the medical

nanobots invisibly coexisting with her biological cells. Because those trillions of molecular machines were controlled through a wireless network emanating from a module installed in the server in her house, the whole system was configurable. While wearing the smart suit that she had used in the immersion capsule, the system could supply her every cell with nutrients, repair anything that went wrong, even gradually reprogram her DNA. In theory she could live for years in that suit, never aging or suffering any disease or decay or discomfort, not even so much as ordinary hunger or thirst.

It was a miracle. It was beyond magic. She was immortal, perfect, a textbook incarnation of Woman. She could tap almost any knowledge in the world just by thinking about it. She could remember anything. She could read and even memorize a novel in a few seconds if she wished. She could understand any known language that had ever been spoken by human beings. New skills were available to her as quickly as she could locate and download them. If she wanted to take up ballet, she could be dancing on point in minutes. Throughout every era of human history but this one, they would have called what she was a goddess.

Cylara knew she looked the part. Flawless classical features, five foot seven and 120 perfectly arranged pounds, her face could have launched two thousand ships, and her naked body could give guys stiffies at fifty paces. She was Helen, she was Venus, she was Athena. Ancient civilizations would have sung her praises and worshiped her above all others.

And yet here she sat, wondering what was the use of keeping this flesh, this form, this biological perfection. Was it mere vanity, or was it fear that kept her returning to resume residence in this squishy shell from time to time? Fear that she was after all but a mortal woman, and that should the day ever come when the thoughts she thought or the emotions that she felt were no longer even partly carried by the neurons firing in her brain, that on that day she would perish?

She knew that this was not a rational fear. Already most of her thinking,

and quite a lot of her feelings, took place on non-biological computer hardware separate from the neurons and spindle cells in her cranium. If the proportion ever became a hundred percent, what difference would that make to her persistent organizing pattern, which was the essence of her unique identity, whether that pattern inhabited flesh or circuitry, and was embodied in chemical reactions, or in electrical currents, or in molecular interactions?

Cylara ran her fingers through the thick silk of her blond hair, over the smooth softness of her face, down to cup the pointed fullness of her breasts, around the sleek firmness of her rounded hips, and finally brought them together in the taut, muscular heat between her thighs. She shivered again. Something in this body was *her*, there was no better way to put it than that, even though her virtual bodies were closely based on this one, and in truth looked and felt at least as good. Was she so laughably in love with this comely female flesh that she couldn't bear to part with it? Was it her pride in the fact that her real body, her natural body, was so much hotter than the real bodies of most other women? Yet what good was that, anyhow? Everyone looked exactly how they wanted to in the cybervers, and never knew (or usually even cared) what the other person's "real body" looked like – or if they even had one, or if it was the same gender as their avatar if they did. Perhaps her problem *was* vanity, after all.

Or was there a problem in the first place? What after all was the issue with keeping a small part of herself biological? It meant keeping this house, and coming back to it once in a while. Not that she actually needed to, unless she wanted to experience existence through her original senses. She could and did meet with Paia regularly when immersed. In fact it was more convenient to call on Paia in her own office, rather than pull Paia out here into Cylara's meatspace garden as a cumbersome hologram, drifting along like a ghost.

Paia was watching her mistress with an expression of concern. "You are troubled, Cylara?"

The mistress sighed, but faintly, having neglected to take an enabling breath first. "Not really troubled, dear Paia, just wondering why I keep coming back here when it doesn't do anything to make me happy. Being in my body makes me a bit moody, in fact. Maybe I should become more like you."

Paia's smile flickered, having recognized the attempt at a wry jest. "Would you like me to investigate current procedures and costs for transitioning to a Full Sing, mistress?"

Somehow this was awkward. Cylara knew that Paia was quite a bit brighter than the average biological human. Certainly her memory and data analysis abilities were much greater, although her personality was thankfully missing most of the quirks and eccentricities that would normally accompany such intellectual gifts in a Mosh. Cylara was the mistress because, well, because Paia was a program which Cylara ran on computer resources which she controlled. But if the woman ever became as purely virtual as her programmed assistant, then they would both be programs running on computer substrates, and what then would separate them, except the fact that Cylara selfishly allocated more and better resources to herself? Cylara had bought Paia from a software company fifteen years ago, and had lavished almost every upgrade and enhancement on her that she could afford. Paia was more than an assistant, she was a friend, a business partner, almost like a sister. Cylara cared about Paia, and wanted her to be happy, even knowing that she wasn't strictly programmed to seek happiness for herself. She could no more switch Paia off than she could strangle a child.

Becoming a Full Sing would definitely mark a watershed in their long relationship. Perhaps Cylara wouldn't need Paia anymore. Or perhaps she could integrate her into herself. But change seemed certain. And so the question, though mildly and earnestly asked, felt like Paia offering to sacrifice herself. Cylara felt an answering twinge of pain, of guilt, of incipient regret.

“No, my friend, I don't think that will be necessary right now. I just get these moods. I seem to go round in circles in my mind, I feel like I don't know what to do.”

Paia nodded silently. Then she proved that after long acquaintance with her mistress, her programming was sophisticated enough to intuit how Cylara's mind worked. “I am attuned to you now, and would find it difficult to serve another. But I want you to be happy. I don't want you to hold yourself back for my sake.”

Cylara's eyes misted with tears. She wanted to embrace her friend, but clutching at a hologram would be silly and pointless. “I couldn't bear to go on to such things without you,” she said after a moment, striving to keep her tone neutral. “We'll stay together, whatever happens. I promise.”

“Very well, mistress. You appear to be getting cold sitting there. Would you like to go back into the house now?”

Cylara stood, picking up her empty mug. “Yes, I would.”

As she walked with Paia back toward her door, she reflected that she could certainly afford to spend at least one day hanging out around the house. She hadn't committed to be anywhere until the day after tomorrow, when she'd promised to meet Torch. He'd said he had some “real life” issues of his own to take care of. A bit odd, really. Who called meatspace real life anymore? The cyberverses were just as real these days.

His reaction to the idea of getting Salma's cousin Arturo resurrected by the Last Trumpet Project had been a little strange, too. Almost like he didn't want to encourage it, but felt he couldn't say anything against it. Why would he be opposed to the idea, especially after he dragged them all off to that New York City simulation? Changing his mind about the Project?

She supposed there would be a lot of that kind of reassessment going on. The metaphysical aspects were one hell of a tangled mess. Personally, she never worried too much about metaphysics. She had some hangups and concerns about giving up her original human body, but that certainly wasn't because of her soul. Cylara tended to equate her conscious awareness with

her soul anyway, as she supposed most people did.

Maybe she ought to have a conversation with her guy on the topic of souls. That might prove interesting. Although really she didn't care what her lovers believed, as long as they were fun to be with, treated her nice, turned her on, and took her to the moon in bed. Torch was certainly all that.

She'd not been up for even an hour, and already she was somehow weary, though of course not physically. "The jaded goddess is tired of this already," she muttered with a wry grin.

"Mistress?" Paia queried.

"Heh. Never mind."

The order in which the operations shall be performed in every particular case is a very interesting and curious question, on which our space does not permit us fully to enter. In almost every computation a great variety of arrangements for the succession of the processes is possible, and various considerations must influence the selection amongst them for the purposes of a Calculating Engine. One essential object is to choose that arrangement which shall tend to reduce to a minimum the time necessary for completing the calculation.

-- [Ada Byron](#)'s notes on the analytical engine (1842)

Chapter 14

Dead Man's Contract

It turned out that despite his personal acquaintance with Stefan, Clay and Salma were only able to meet with Stefan's Paia. The temporal physicist was just too busy to meet personally with his former employees. But Clay's request for a meeting had at least yielded the cyberspace coordinates of his Paia's office.

The young couple zoned into the end of a hallway in a suite of offices. A steady flow of traffic along the hall circulated amongst the dozen or so doors opening onto it. Salma clasped Clay's hand and started forward. The fourth door on the right bore an antique brass nameplate reading "S. Jager, Unit 666."

Clay had to chuckle. "I guess if the shoe fits, Stefan is going to wear it." He pressed the button and a musical chime sounded through the door.

"Come in," said a female voice from within. Clay twisted the handle and the young couple stepped through the heavy door.

Inside, the office was brightly lit by afternoon light, through walls that were almost entirely glass. The space was large and open, roughly circular, with a panoramic view out over a cityscape of glass and nanosteel office buildings, standing mostly at lower altitudes. It was immediately apparent that this was probably a purely virtual view which did not correspond to any particular meatspace metropolis. Still, it was nice. The windows were slightly tinted on the side facing the sun, which was not quite halfway to the western horizon. Cool air conditioning kept the temperature brisk but comfortable.

At the largest of the worktables near the center sat an auburn-haired woman of indeterminate age, perhaps mid thirties. She was attractive, with a sumptuous body, but dressed very conservatively, almost austere. She rose as the door closed behind the two visitors.

“Welcome. I am Paia to Dr. Stefan Jager, of the Archimedes Institute for Temporal Physics.”

“Thank you. I am Clayton Thorsten, a former contract employee of the Institute. This is my girlfriend, Salma Rivera.”

“Pleased to meet you both, do sit down.” Paia gestured to a couple of comfortable padded chairs which waited in front of her desk. All three of them were seated.

“Thank you for allowing us to make this appointment,” Clay said. He recognized that many Paias made such decisions without even contacting their principals, and wanted to make sure that this one understood that her good judgment was appreciated. Paia nodded politely and waited for him to proceed. “We asked to see you in reference to one Arturo Scalleni, recently deceased, whose name has been submitted to the Project for temporal digital recreation.” Clay was deliberately careful to use the correct technical term, TDR, rather than the slang terminology of resurrection.

Paia nodded understandingly. “You are of course aware that at this time it is hardly possible to expedite all such requests received.”

“Of course.”

Salma stirred. “Clayton makes this request on my behalf, Paia. Arturo was my first cousin.”

Paia's impassive face did not go so far as to wince, but definitely registered empathetic regret as her eyes met Salma's. “My condolences on your loss, Ms. Rivera. However, the circumstances stand. How did Mr. Scalleni die?”

Clay and Salma exchanged a glance. “He perished in a flood. The riverside community in which he lived was swept away when a dam broke in the middle of the night upstream,” Salma replied.

“Ah yes, we've received a number of TDR requests surrounding that disaster.”

“I expect you have,” Clay continued. “Arturo was a very advanced Sing. His professional work lay in the area of complex systems replication. Given that the Project is presumably looking to duplicate proven system prototypes, in order to expand exponentially the speed and capacity of its operations, I would be somewhat surprised if you didn't intend to recruit him at some point in the near future.”

Most Paias, when confronted with such a supposition, would have activated a holoscreen or some other datapad device, in order to access the data stores necessary to confirm or deny it. This one did not. She merely raised an eyebrow and looked aside for a moment as she accessed the necessary data. In only a few heartbeats she looked back at Clay.

“I see that you are correct, Mr. Thorsten. A contract offer was to be extended to him in a few days' time. It is, naturally, contingent upon his availability.” Paia's eyes twinkled.

Clay smiled. It seemed that this Paia was programmed for dessicated wit. “Then you will need to move him up the priority queue in order to avoid the contingency clause in his contract,” he observed in an identical tone.

“It would seem so. I will certainly relay this information to my employer. Now, on the subject of availability, a later phase of the Project will call for more public relations specialists, which is your own area of expertise. I'm sure you can well imagine how that might be the case. Your previous work for the Institute was satisfactory. Can we count on your availability in, say, a month's time?”

Clay did not have to feign a certain amount of surprise. “I might have to postpone taking some other work, but yes, I expect I could be available.”

“Excellent.” Paia stood up, and they understood their interview to be at an end. They exchanged thank-yous, goodbyes, and handshakes with her and made their way out to the hallway. As they walked back down the hall

toward the zone point (an incongruous revolving door at the far end) Salma gave Clay's hand an excited squeeze.

"That went perfectly," she observed.

"We made it past the gatekeeper," he agreed, with some relief evident in his voice. "She's going to tell Stefan."

"And you got a job offer out of it, too. How did you know that about the Institute planning to employ Art?"

"I didn't. It was just a lucky guess, based on his background."

"Well I'm glad you bothered to look into his background. She wouldn't have known, otherwise."

"I'm not so sure about that, Salma. I wouldn't underestimate the Paia of a Full Sing. Hell, she's probably a lot smarter than we are."

Salma laughed as they stepped through the revolving door together. They found themselves emerging in the lobby of a mountain lodge. Its furnishings were rustic but comfortable, with lots of varnished wood and polished logs in evidence. The room looked dim after the big glass-sided office. The view outside was gorgeous: a sweeping valley rising to pine and fir clad slopes beyond, topped with purplish granite peaks still sparkling with snow in their highest cols even in deep summer. A ticking clock on the wall in the shape of a sundial showed that it was quarter past ten.

Salma sighed happily and gave her boyfriend a hug. "We still have time to change and get down to the stables in time for the picnic trail ride up to the hanging lake," she said, gesturing at the clock.

"Yep, I'm there." He put his arm around her and they headed down the carpeted corridor toward their suite.

"Cylara told me they have some of her riding outfits available here. I'm going to try one on."

Clay laughed. "Okay, I'll do the same. Always buy from friends."

The least initial deviation from the truth is multiplied later a thousand-fold.
-- [Aristotle](#) (384 B.C. - 322 B.C.)

Chapter 15

The Breadcrumb Protocol

"I'm sorry it hasn't produced better results, so far."

"I'm sorry too," Maxwell Cleary replied. "I know what you're going through."

"The trace just hasn't shown anything special, no matter where I've gone."

The two men sat in the family room of the Cleary home, which was a large sprawling complex of buildings in rural northern Idaho. Reverend Cleary's eyes looked a little weary behind his trademark glasses. His tie was loosened and casually askew, and his hair was slightly mussed, probably from playing with the dogs in the yard earlier. Outside the window, the winter night was coming down fast; it was too cold now for anyone to want to go outdoors again. The Reverend had a fresh cup of piping hot cocoa on the walnut table in front of him, and he tasted it now and sighed pleasantly.

The other man who sat facing him was considerably younger, and resembled him facially, but with dark brown hair rather than auburn. He had a mug of hot tea before him, and took the opportunity to take a sip when the Reverend reached for his cocoa.

"None of the worlds I've visited seem to be using any particular common servers," the younger man continued, as they set their drinks back on their coasters. "Not even the special Sing world that's supposed to house the counterfeit copied souls."

"What about unusual proxy routings?"

"That would have been noticed, due to the packet timings."

Cleary looked decidedly uncomfortable. "So you've spent weeks immersed in blasphemous fake worlds, away from your proper life, separated from your home and family, in peril of your soul, and yet it has

brought us no closer to an understanding of where the Sings are hosting their latest delusions.”

“I wouldn't go that far, sir,” the other replied crisply. “We may have failed of our primary objective for the moment – though the analysts from Ferret claim that sometimes patterns eventually emerge once you have enough raw data. Perhaps we just don't have enough, yet. But I *have* made some progress on the personal contact front. I think I may soon be in a position to actually meet one of these scanned and instanced simulacrum.”

Cleary's eyes narrowed, and after a moment he nodded. “If you can meet him on his own ground, that will help. Then we'd know for sure that you were touching servers that have to be involved.”

“Exactly. The Lord works in mysterious ways. I believe that if we persevere, we will eventually find the information we need.”

“I pray nightly that we shall do so, and soon,” Maxwell Cleary said gravely. “I'm very concerned about your having to do this. When I think of the filth with which you've had to pollute your body to make this possible...”

“I feel all right. I don't think I've taken any lasting harm from it. The nanites can be removed.”

Cleary shook his head. “Daniel, you are my son. I'm concerned for you. You of all people should be preserved from this technological contamination of the psyche. It bothers me to see others, strangers, do it to themselves. Still less you, who know better, who *are* better, than this.”

“I volunteered, father. You accepted because you can trust my judgment.”

The elder Cleary reached over and patted his son's wrist, then squeezed the back of his hand. “I know I can, Daniel. I'm proud of you. But you must make allowances for a father's fears.”

Daniel smiled. “I do.”

Maxwell returned his son's smile for a moment, then moved on to his next topic. “Now, about this woman who is your primary contact, have you traced her?”

"No, not yet. I'm hoping she'll volunteer the information on her identity and location freely at some point."

"Good. If she does, we can probably monitor her jack too, and double our effectiveness via the addition of another point of scan."

"Yes."

For a moment, the Reverend's eyes seemed to focus a long way away. "Have you considered trying to contact her in reality?" he asked at last.

"Not so far. It isn't usually done, you know, with people you know only in virtuality. But it might happen. I think she, uh, genuinely cares about me."

"Indeed? And do you also care about her?"

Daniel Cleary shrugged. "She's a woman, father. She's a real person, somewhere. A basically good person, I think. I don't suffer any illusions about her wanting to trade what we have in virtuality for a real life love affair, but someday, maybe, when I can tell her the truth and give her a chance to repent and come back to God, she'll entertain the idea."

"And you would like that?"

"Yes. She deserves better, father. Everyone does, and she's helped me a lot."

"Well, if God wills it so, I've no doubt that her reward can be to be saved, when the rest are lost. Just be sure that you do not desire her personal salvation too highly, for she may yet make the opposite choice."

"I understand that, and I won't."

Cleary sighed again, sipped some more cocoa, glanced out at the burgeoning night.

"So when do you go back?" he asked.

"Tomorrow."

A silence. "So soon."

"It can't be helped. I have scheduled commitments to keep."

His father nodded. "So do we all. I have to travel again myself tomorrow, to visit some of our brethren on the east coast. Do you have everything you need?"

“Far as I know. I'm sure mother won't be happy, though.”

“How could she be? A husband almost never home, and an eldest son who's gambling his life and his very soul for the cause by compromising with the Devil and his abominations. Whenever I feel my motivation flagging, I have only to think of your mother and her sufferings, and I know at once that no one should have to endure such things, and that this is why we struggle. Families are meant to live together, not to be rent apart by what they must do.”

“We'll be fine, father. God will take care of us in this life, and our sacrifices will be rewarded by being together forever in the next.”

The elder Cleary nodded. “I love you son, and want you to remember that the Order's future triumph will belong as much to our family as to anyone, I suppose.” He picked up his mug and abruptly finished his cocoa. “Except for the Lord of course,” he amended with a flicker of a grin. “Daniel, will you come to the chapel and pray with me?”

The younger man rose as his father did. “Of course, father. I too will need strength for my journeys tomorrow.”

“The Lord is our shepherd, we shall not want,” said the Reverend fondly as he put his hand on his son's shoulder and walked beside him toward the chapel.

If you don't read the newspaper you are uninformed, if you do read the newspaper you are misinformed.

-- [Mark Twain](#) (1835 - 1910)

Chapter 16 Scanning for Murder

“Justin, I've got something I want to show you.”

Justin looked up from the system monitor he was studying and walked over to stand behind Stefan's chair. Stefan was adjusting the display in the holo-monitor, which was showing the live feed from the Cronus Scanner. Or one of the Scanners; there were now three of them in continuous operation. The scene showed an earthen-filled dam, covered with snow, dim under the stars on a winter night. At first Justin couldn't see anything of interest, and cast Stefan a quizzical sidelong look.

“Let me zoom in some,” Stefan said, and as he suited actions to words Justin saw some small dark figures moving around near the base of the dam, and a few more about halfway up the slope, operating some kind of machinery.

“What the hell is that?” Justin asked.

“You remember that dam that broke in B.C. in late December? This is it, a couple of hours beforehand.”

“Oh yes, I remember hearing about that. So what are these guys doing, repairs or sabotage?”

“The latter, I'm afraid. They're drilling cores. And if I'm not mistaken, they're putting plastic explosives down the holes.”

Justin sat down in a chair next to his friend, and gave him his full attention. “Who the hell would be out in the freezing wilderness in the middle of the night, blowing up an old dam?”

“Who indeed? Perhaps an even better question is why.”

“Somebody got tired of ice fishing?”

Stefan had to smile. “Apart from all the fish, there were human

casualties: the residents of a small cyber-immersion village a few miles downstream. Forty-seven people, no survivors.”

“You think maybe someone was trying to kill one or more of those people? Or were they incidental? Anyone we know?”

Stefan shrugged and zoomed in some more. “We've gotten a number of TDR requests for some of those forty-seven victims. One of them was for a man named Arturo Scalleni. We had a pending contract offer for him, to work on the Project. When Paia told me about that I got curious, and decided to research the circumstances of his death. I followed the wall of water back up to the dam break, then decided to see if I could find out what caused it to let go.”

Justin looked concerned. “Can't fault you there, that is a bit suspicious. But who would have known you were going to hire him?”

“Well that's the point, nobody. Scalleni hadn't even received our offer yet, and he's never worked for us before.”

“So why would anyone want to kill him? I'm not following.”

“I'm not sure there's anything to follow. Could be just a coincidence. But the fact is, these guys here are sabotaging that dam so it will fail in the middle of the night.”

Justin thought a moment. “These men here on the dam. Can you tell if they're Moshes?”

Stefan twiddled some controls experimentally, studied some numbers which streamed by on the edge of the holoscreen. “Well, there are no electromagnetic emissions to suggest embedded nanocomps in use in the area. Doesn't prove someone doesn't have a neocortex that's just switched off. But yeah, they could be Moshes.”

The two Sings exchanged a glance. “The KOJ gang, perhaps?” Justin mused.

“Could be, Justin. I suppose we might find out if we backtracked the personal history in time of some of these men.”

“Hmm. Assuming some or all of them are members, why would the KOJ

want to blow up this dam? Seems like a pretty minor act of terrorism, doesn't it? Why not something bigger, that couldn't be mistaken for a natural occurrence?"

"Indeed. Besides, I thought the KOJ philosophy was all about God and country, law and order, that kind of thing. Seems an unlikely bunch to commit terrorism or even random vandalism."

"That, Stefan, may be sloppy thinking. Sometimes your law-and-order types commit more mayhem than anybody."

"True. So why do you think they did it?"

"I'm not sure yet. What else was destroyed, apart from the immersion village and its inhabitants? Anything else get hit downstream?"

"Not really. About five miles below the village the stream merges into the Fraser River. Its flow was very low, given the temperature and the time of year. The main river channel is wide at the confluence with the tributary, and it absorbed the additional water pretty easily. A mile below the junction it scarcely even overflowed its banks. Property damage further downstream was minor, with no loss of life."

"So that suggests that the target must have been either the dam itself, or the village. You said it was an immersion community. What else? Were they doing any hosting there?"

Stefan rolled the Scanner back to some saved settings, replayed the destruction of the village by the wall of water and debris rolling down the narrow canyon, in slow motion. The two men watched the signature flashes of fusion generators powering off as they were uprooted.

"I count three fusion plants at least," Justin observed. "With one or two more possibly concealed under the leading edge of the water. Only small units, but that's still some pretty substantial power capacity, way more than they'd need for those few buildings and fifty jacks. They were hosting something," he concluded.

Justin spun his chair to another console, rapidly entered some cyberspace coordinates and access codes. A network analysis system's control panel

appeared. He input the date and time of the village's destruction, gleaned from Stefan's frozen scanner display, along with the GPS coordinates. A connectivity map appeared, showing the approximate position of any equipment that was transmitting packets which were part of the global mesh, with the nodes coded by spectrum proportional to the bandwidth being utilized. Sure enough, the location of the village glowed a nice warm yellow, contrasting starkly with the near blackness of most of the surrounding remote area.

Stefan was now watching over Justin's shoulder. "Bingo," he said.

"Uh-huh. Perhaps the deaths were incidental, or at any rate anonymous. It may have been whatever was being hosted there that was the target."

"Any way to find out what that was?"

"I'm going to try," Justin said, continuing to access available data stores. "I'm now checking catalogs of virtualities open for business on that day, and cross referencing with closures, ones that went offline around that time. Damn. Seventy-five of them. Well, it was the day after Christmas, so some of them were probably seasonal. Okay, which ones had announced service termination in advance? If I eliminate those, thirty-eight left. I'm going to assume that service would likely not have been restored, even if they had a backup site, owing to the deaths of the operators. Which leaves us twenty-three candidates. And these two here I can eliminate because I'm familiar with them and know where they were hosted. So we have twenty-one virtual worlds, some or all of which may have been hosted in that village."

The two men scanned the list. No unifying characteristics were immediately apparent. Content categories, pricing, payment methods, all pretty expectable. No common marketing labels, although several were promoted by the same popular marketing firms, doubtless according to contract alongside thousands of other virtualities.

"I see nothing here that would inflame the KOJ," Stefan concluded. "And how would they know what was hosted there anyway? It's not like the Moshes are capable of doing the analysis you just pulled off."

“Agreed, most Moshes aren't. But some of their buddies in the North American Federation government might just be capable. They aren't monitoring nearly as much of the mesh as they think, but they do monitor enough of it to deduce where some major sites are. Maybe it's not so much what was being hosted at the village as the fact that anything at all was being hosted there.”

“The site's remote,” Stefan agreed, thinking in tandem with Justin now.

“And the method of its destruction could easily be put down to a natural disaster. And probably would have been, had it not been for the Cronus Scanner.”

Stefan grinned. “Yes, it *is* handy to be able to spy on your enemies this way, though that's hardly what we designed it for.”

“Still, what of it? It's not like there's a handy lake poised above every brain house in the solar system. If the KOJ is just trying to cause random cyberverses outages and disruptions, there are a lot bigger and better targets that they must be aware of. So why start here? And why not continue? There haven't been any similar “natural disasters” before or since, have there?”

Stefan shook his head. “Not that I could find. It seems to be a one-off job.”

Justin sighed. “I know it must seem like a waste of resources with only three Scanners operating, but I think you should backtrack one or two of those men at the dam. Select whomever appeared to be in charge. Find out who they are and where they came from, and if there are any more at home like them.”

“I'll do that,” Stefan replied. “And something else I'm going to do is bump Scalleni up the queue. I want to interview him and find out if he knows any special reasons why radical Moshes would want to kill him or his neighbors. Apart from which, I need to hire him!”

“Hell, do 'em all.”

“Yeah, I think I will. They're our folk, Justin. They were all Sings, and

they died to enemy action.”

Justin twitched an eyebrow at the physicist. “Enemy action? I appreciate the sentiment, but this isn't a war, yet.”

“I think it will be, soon. This is an opening salvo of some kind, I can feel it.”

“I hope you're wrong, but you could certainly be right.”

“That's why I need more Scanners running. Which is precisely why I need Art Scalleni!”

“How dare those KOJ rascals muck with your expansion plans!” Justin exclaimed with mock indignation.

“Damn right. They'll rue the day.”

Justin clapped his friend's shoulder in a comradely gesture as he rose and turned to go. “Thanks for letting me know, Stefan. And now I have to go see a man about a terrorist.”

“Heh. See ya.” Stefan turned back to his equipment as Justin zoned out.

The senate is a beast, the senators are good men. -- Roman proverb

Chapter 17

The Dedication

Senator Robert C. Reynolds surveyed the setting in which he was to address the small crowd in a few more minutes. An enormous long tent, like a circus pavilion, had been erected near the hilltop, with a platform built under one end of it. The tent, surprisingly, was a hindrance today, and would serve only to prevent the attendees from standing in the uncharacteristically brilliant morning sunshine. The temperature was brisk, but the calm, sunny conditions on this mid-January day had already persuaded him to unbutton his overcoat.

In the near distance, the towers of downtown Vancouver sparkled like a picture postcard from yesteryear. Only a few streaks of high nimbus clouds in the far northwest, way out over the island, marred the otherwise cerulean sky. The rich gladness of the day somehow felt hollow to Reynolds. Days like this were unexpected diadems, treasures punctuating the grey tedium of damp, cloudy winters in the Pacific northwest. The hollowness arose not just from the thinness of the crowd which he was about to address, but from his certain awareness of how few residents of this fair city would even witness the beauty of this day.

Then there was the irony that they were here to celebrate the inauguration of a new charity housing project, where the otherwise homeless and destitute could find shelter, sustenance, and community; but where every dwelling unit was, necessarily, equipped with live cyberverses jacks that would let the residents spend most of their time immersed in virtualities where they would never notice the anomaly of a sunny, cheerful winter's day in Vancouver.

Helping people was what made it all worthwhile to Reynolds. Everything he did, all he had ever done in decades of public service, was dedicated to helping others. Since the death of his wife, it had become the primary

mechanism through which he expressed love and compassion. He felt immensely grateful for every rich year he had had with Marguerite, but couldn't help feeling that his passion, and his happiness, had been a little selfish. So as the years passed he had consciously tried to transmute that selfish passion into selfless service of others, into brotherly love for humanity, in an effort to pay something back for all the happiness he had once enjoyed.

To be sure, there were rewards. Reynolds firmly believed that he who witnessed human suffering, and did not hasten to relieve it, was ignorant of the lesson that it was more blessed to give than to receive. The conflict lay in the realization that, in some cases, giving people what they needed or craved in order to relieve their wants, might not be the best thing for them. So what then? Command them to do instead what you well knew would be best for them?

Senator Reynolds was painfully aware that those days of social engineering were over, that such was wishful thinking at best. It might irk him that the majority of the people living in this part of the world would never notice today's gorgeous weather, or care about anything he did or said, or even what was happening in the real world in general, but what could he do about it? He was vividly aware that virtuality delivered almost anything the mind could imagine. This city's denizens could spend their time in a Vancouver where every day was like today. They could travel anywhere that someone had imagined and created before them. Or they could even imagine their own realities and offer them to others. How on earth could "real life" compete with a world in which you could have anything you wanted, be anything you wanted, and be with anyone you wanted?

He had always detested the term "meatspace" – it was so derogatory. Meat was stupid, meat was food, and when uncooked it was gooey and gelatinous and disgusting. For eons humans had been living, breathing, thinking, feeling flesh; but Reynolds felt no disgust at being biological,

despite its limitations.

Not that certain biological improvements weren't useful, even necessary, for most people. The genes he had inherited from his birth parents had revealed some alarming flaws when he'd had his genome mapped back when. He'd possessed disturbing predispositions toward both cancer and congestive heart failure. Somatic gene therapy had corrected that of course, just as it had arrested his natural progression toward his chronological age of sixty-three. But he had never wanted to go whole hog with a nanobot neocortex, respirocites, a GI-tract replacement, skeletal-muscular augmentation, and “upgrades” to his other important organs. He was content spending his life as a Mosh in this so-called, much-reviled meatspace.

This was, unfortunately, a minority opinion these days. Already there were critical labor shortages in almost every field from nanomedicine to gardening. Even most of the people who still had jobs in meatspace kept them merely to earn money they could spend in the cyberverses. Indeed, cyberverses currencies were widely used to pay for goods and services in meatspace, because both parties knew that they could exchange those credits anytime to almost anyone, whether or not they themselves ever visited the particular cyberverses worlds where those currencies originated and had value.

A year or so ago, Justin Turrell had sent Reynolds an economic study produced by one of his Sing colleagues, which analyzed relative labor costs in both the cyberverses and meatspace, and explored the ways in which prices in one influenced prices in the other. The study opined that labor scarcity in meatspace would raise the price of labor there so much that people would actually be drawn back to jobs in meatspace, because they could make so much more so very quickly. This would remain true until innovation discovered ways to perform the required meatspace tasks through artificial intelligence or robotics more cheaply than humans could do them, at which point the jobs – and the workers – would vanish back into

the cybervers. In the end, the study projected, after numerous oscillations back and forth, ninety-nine percent of everything in the physical world would be automated and all but a tiny remnant of human labor and intellectual capital would forever be deployed in virtuality.

That seemed like a way of saying that everyone was destined to become Sings, and that this was a good thing. But he, Robert Reynolds, had seen the “invisible hand” fail altogether too many times in his lifetime. Why, even this dedication today was proof of it. Why should thousands of human beings, either unwilling or unable to find a niche in meatspace, end up as wards of the state, if the system was perfectly balanced in some sort of market equilibrium?

There were, he knew, more radical voices within the Mosh community who absolutely loathed and resented this trend of humanity gradually vanishing into worlds of its own creation. Those voices frightened and pained him. If he was sure of anything, it was that you couldn't force billions of people to do what you wanted against their will, and that if you even tried, the result would be horror beyond imagining. He wanted nothing to do with mass violence, and when you came right down to it, that was the only tool that government had available to do anything to change human behavior on such a scale. Whenever persuasion was useless, force became the only resort.

Reynolds' belief in democracy, as the basic underpinning of state power, prevented him from being able to accept the proposals of the Mosh reactionaries within the Federation. He may not like it, but the fact was that in choosing not to be around to witness this bright, fine day, the silent majority had cast their votes for the worlds they preferred over the one world that he preferred. So as a good public servant, he had his marching orders, and they did not include giving government approval and support to what amounted to a holy war to turn back the calendar.

The senator sighed and checked his chronometer. Almost time. He started moving toward the pavilion. Peter and his other aides fell into step

beside him. As they entered the big tent, they were noticed by the crowd milling around near the front, who began to take their seats. Some smiled and waved. Reynolds was careful to make a point of stopping to greet anyone whom he recognized, or who looked earnest about shaking his hand and saying hello. Picture of a politician pressing the flesh at a public appearance, as old as time. The greetings and introductions passed over him in a blur of phatic utterance. An aide was discreetly recording everything using an implanted experience recorder, so he made no real effort to remember the specifics of what anybody said.

Once they had reached the front, one of the organizers jumped up to the podium and asked everyone to be seated. Then after a brief and respectful introduction, it was Reynolds' turn to hand off his overcoat and ascend the podium to a smattering of applause. Once there he paused for a moment to scan the audience before him. There were some sixty or seventy persons present, less than a third of what the tent could have sheltered. Quite a few of them were local government workers, or part of the work crews that had assembled the prefabricated housing units now standing on the far slopes behind them. The rest were probably prospective inmates of the project, with a few additions who might have been out walking or something and just happened by to find out what was going on.

He supposed the old lady in the front row might be one of the latter. There were those people who chose not to embrace modern technology, who consciously preferred to go on living as they were, without even taking advantage of life extension science, though at the peril of their lives. Such individuals were increasingly desperate to maintain normal human contacts and relationships. For the true Moshes, the real world was becoming an ever more lonely place.

For a moment Reynolds wanted to walk off the stage, say to hell with it, and go straight to the nearest nanoclinic and order a top-of-the-line nanocomp neocortex installed in his head. He didn't have any cyberversal currency, but the clinics still took ameros last he heard, and he had plenty

of them. Then he could do like his Sing constituents and go fishing, like he had with his granddad in Manitoba back when he was a boy. Screw meatspace and politics; if you can't beat 'em join 'em.

But he knew that he couldn't do that. What *he* needed at the moment was beside the point. That wasn't service to others. There were people here who were counting on him to do things. He made himself smile at the old woman, though she made him want to weep. She beamed back at him, intent on whatever he meant to say. Most of the rest of them looked mildly interested, tolerant, or bored. A more phlegmatic audience he could hardly have wished for. All right then. He would talk to her. And to anyone who might bother to tune in to whatever meshcasts would be making his remarks available in virtuality.

“Since the early days of representative government, it has been the duty of those in public service to provide for the public welfare,” he began. “A social safety net has consistently provided housing, medicine, and sustenance of last resort for those who had no other refuge. I'm pleased to be able to announce that the North American Federation is still actively providing that network of support, and that the rumors which you may have heard about the demise of government in our time have been greatly exaggerated.”

Scattered applause greeted this opening witticism, and the senator dropped his eyes to his prepared text in front of him. It was all there: the details about the new housing project, the kudos and plaudits to the donors and builders, the wise words about the importance of charity toward one's fellow man, the usual pious hopes about folks moving out of the project instead of becoming permanent dependents, even some well-placed barbs impugning the motives of those who categorically resisted the idea of enforcing the tax laws to give government expanded resources. With the practiced ease of a man with decades of public speaking experience, Reynolds read his speech text in his loud, friendly, thoughtful voice, while only seeming to glance down occasionally. He didn't need to think.

But in the back of his mind he was nagged by worries. Worries about the radicals in the clergy, hell, even in his own government, and what they might someday try to do. Worry about what the Sings might do in response. He counted Justin as a friend, but in a way the man terrified him. What would a super-intelligence do if attacked? Engineer a killer virus to wipe out all the unaltered humans? If this Last Trumpet business didn't light the fires, how long would it be until the cyber portion of humanity did something that inevitably would? And even if nobody on either side did anything dramatic, how long would human life as he had known it continue? What had the last twenty years been but the long, slow death of human culture and community in the four dimensions of real space and time?

The needless pavilion that concealed the assembly from the bright day outside suddenly struck him as symbolic. Like the cyberverses, it was constructed by man, and cast a shroud over them which separated them from the open sky, whether grey or blue. But the metaphor failed as soon as he recalled that one could easily walk out from under this tent, as they all would once he had finished speaking. He did not think that humanity would ever manage to walk out of the cyberverses. Not even if someone somehow blew the whole damn thing up. The great mass of people would emerge from their virtual immersion, doubtless incredibly piqued, and just build the entire thing all over again. Probably after angrily stomping the bombers into dusty red goo. You would have to eradicate the ideas, and Reynolds knew painfully well that one cannot kill an idea.

As he concluded his speech, he felt like a mere simulacrum of a man, like a puppet delivering an oration for an unseen ventriloquist. When Justin donned his garb of flesh and came to visit his office, was he a simulation of a human being? Or were people like Justin the real thing on some higher level, and it was the Moshes who were simulations, or perhaps atavisms, of what humans *could* be?

Some people cynically supposed that the entire universe might be a simulation, running on somebody else's vast computer. It was almost

enough to make a guy become religious. But in his view that was the ultimate cop-out, turning your destiny over to some supernatural being whose motives you couldn't possibly understand, whose very existence you could never even prove. Becoming a “believer” would be even worse than just walking away and becoming a Sing.

Applause, some of it actually sounding heartfelt, brought him back to himself as he finished his speech. He grinned and waved to acknowledge the reception, then stepped off the platform to shake some more hands and do some more mingling. He still had a few minutes before his aides would whisk him away to his next event, a luncheon with some of the party faithful. Reynolds made an effort to enjoy himself, to take pleasure in his job, to push back his concerns about the future. That too was a thing you got good at, after a while.

Whenever you think you are facing a contradiction, check your premises. You will find that one of them is wrong.

-- [Ayn Rand](#), *Atlas Shrugged* (1957)

Chapter 18

A Peculiar Installation

This had to be the weirdest installation he had ever done, Taylor McGivens reflected. In more than five years of working for Petrovmesh, he'd never seen anything like this. The location was remote, some ten miles outside the nearest town, which was Esker, Labrador. In the middle of January, for Chrissake. He'd flown in on an aircar, equipped for cargo and rigged for stealth. That in itself wasn't unusual; plenty of Petrovmesh's brain houses were in remote places and got set up in secret.

His cargo *was* unusual. Here were none of the latest systems which the company usually deployed, which its business in fact relied upon, given the extraordinary quality of the virtualities which were dreamed up by Petrov, its founding genius. When Taylor opened the crates and started moving the systems in here, he found nothing but last-generation CPUs and storage arrays, at least five years old. Stuff the company should have retired already. And this was all going into a *new* site?

The prefab dome was pretty standard, with the usual power generation and remote security features. Its construction was recent, and looked to have been rather perfunctory, but it was functional. The only odd thing about it was that the hydrogen cells were stocked with only enough fuel to keep the fusion generator running for about six months. After that, someone would have to come out and service the site in order to keep it operating.

So maybe the site was temporary, and only intended to run for a short time? After which it would get upgraded? But then why shove these crappy old systems out here in the first place? Why not just start out with new?

And then there were the fee settings. Taylor had already brought up the

power and booted all the hardware. Now he was consulting the configuration data which he'd been provided. He gaped in disbelief at what the palmtop holo-pad was telling him. These prices were flat out ridiculous. Nobody was going to pay rates like these to access CPU cycles this slow. This had to be at least three times the rate that would get any action these days, even at peak times for overflow demand. Could two shipments have gotten mixed up, and somebody thought they were installing new hardware here, but the old shit got sent instead? If so, that would mean that the new gear was probably headed for the recycle bin. He ought to ask when he got back to the office. Shaking his head, Taylor keyed in the specified rate settings anyway.

Next he brought up the external network interface. Like most cyberverses hosts, this cluster was running DR.OS, the Distributed Resources Operating System, once upon a time the brain child of one Justin Turrell. Like other open source software systems before it, DR.OS had been added to and extended by countless others since. Its core protocols, however, were still relied upon to weld the cyberverses together into a single vast community of nodes.

As the external wireless net came up, it began pinging heuristically chosen frequencies, looking for other nodes with which it could exchange data. Whenever one answered, this cluster would transmit a list of the processor, storage, and network bandwidth resources which it presently had available, along with the corresponding micropayment fees it charged for the metered use of each. The answering system would respond with its own capability and price list, which would be recorded by the local network AI, along with the transmission frequency, signal strength, and round-trip transmission time of the other node. Thereafter the two systems would keep each other posted at intervals concerning changes in their available capacities and rates.

Over time, the network's AI would build up a picture, something like a radar screen, of the other nodes reasonably close to it in terms of light-

seconds of transmission time. Whenever a connected user or a running client program wanted more of some resource than its local host could provide, the network map was consulted, and the best-fitting neighbor system was selected. An offer was made for its resources, subject to any price limitations set by the end user. If the offer was accepted, the AI would subcontract the neighbor node to fulfill the demand. If the second node in turn became fully utilized, or stepped up its rates, the next cheapest node would be contacted, and so on. Nodes could also pass off requests which they could not themselves satisfy, by referring the bidders to their own known neighbors, thus harnessing the power of recursion and earning themselves referral fees.

DR.OS was designed as a self-extending network, which automatically shunted demand, like water seeking the lowest point, onto the most cost-effective service providers offering the best available price-performance ratios. Almost everyone's cyberspace jacks and home systems had at least some spare capacity sometimes, which meant that every consumer was also potentially a producer – if the price was right. Justin's genius had been to develop a massively parallel networking protocol that seamlessly integrated the economic aspects with the technical ones.

The prices he was entering, Taylor knew, were just not workable. Even to be a broker node that earned mainly referral fees, you had to have your rates set low enough so that someone would ask you for anything in the first place. Broker nodes typically had low prices along with low capacities, but a densely populated network neighbor map. This cluster he was bringing online had high prices and small capacity, and let's face it, out here in the middle of frozen nowhere its close neighbor list was going to be comparatively short. Response time didn't matter so much for data storage access, but for reselling CPU cycles and network bandwidth, even milliseconds of extra transmission time counted.

Bottom line: why was his employer asking him to set up a brain house that was guaranteed to be a loss leader? As far as he knew, Petrovmesh

had always made a tidy profit. Certainly he himself had always been paid well, and on time. This facility would never repay its own installation costs, so what was the point? Privacy?

There had to be something else behind this. But if it wasn't just a simple mistake, he was very unlikely to find out what it was. Nothing to do but make sure everything was working nominally. Or as nominal as equipment this old could be expected to work.

In less than an hour's time, Taylor was satisfied that no further adjustments were required that could not be done remotely using the proper access codes. So he started up the secure remote console service, and double-checked the environmental and building security settings. Then he packed up his tools, locked up, and bundled his gear back into the aircar. The sun was setting in the southwest, pale and watery on the horizon as this short northern winter day ebbed. The temperature was dropping already, making him glad of his heated thermal work suit.

He swung up into the cabin and sealed the door. As he took his seat he gave instructions to the pilot AI. "Power up for flight mode. Enter GPS coordinates for company depot number 36. Equip stealth flight mode. Confirm readiness wi' computed arrival time."

After a minute or two of whirring and revving and preflight systems testing, the AI replied conversationally: "Arrival in D plus four hours, seventeen minutes. Initiating takeoff on command."

Depot 36, Taylor knew, was in Hungary, so that would put his arrival at after midnight local time. And goodness knows where they'd send him tomorrow. "Commence flight operations," he confirmed, and the aircar obediently launched itself into the evening sky. Taylor settled the seat into a supine position. He had four hours to kill; might as well try to get some Zs.

Any sufficiently advanced technology is indistinguishable from magic.
-- Clarke's Third Law, [Arthur C. Clarke](#), "Profiles of the Future" (rev. 1973)

Chapter 19 Besieged

The enemy horde marched out of the distant horizon, first discernible as a faint cloud of dust. As it drew closer, swarming individual shapes could be distinguished. Alarm horns rang out from the white marble top of the citadel, which blushed pink in the unfolding dawn. As the sun rose slowly in the east, it glinted off the approaching enemy formations.

Riksana stood impassively in an east-facing archway on a balcony near the top of the citadel. Her silken black hair was bound off her face by a silver headpiece bearing a translucent gem in the center of her forehead. Her jade green robes rustled slightly in the morning breeze, her hands tucked into the voluminous sleeves, her feet concealed by the rippling fall of silk. Were it not for the faint motion of her hair and clothes, she might have been a statue mounted on the balcony.

A movement behind her did not immediately divert her attention from the distant spectacle of the incoming invaders. Justin paced the floor behind her and emerged at her side. He was garbed in vestments of a dark red, just a few shades lighter than blood, with a gold headpiece bearing a clear gem closely resembling Riksana's. He carried a tall staff with an ornamented top made of some light, malleable metal wrought in the likeness of a small raven poised for flight. He gazed outward for a minute or so, as motionless as his companion. Then he spoke.

"Twelve thousand, do you think?"

"At least," Riksana replied after a moment. "And they have some heavy siege engines and no small amount of supporting firepower."

"We have enough troops here to man the walls fully, plus our own siege turrets. Unless they can breach our walls, it shouldn't be a problem."

"As long as the walls hold, yes. But I'm sure they know that too, so I

expect they must have some plan in that regard.”

“We'll just have to wait and see.”

Riksana nodded. Justin turned back inside and walked over to an obelisk in the center of the chamber. Inscribed on its side was a rough map of the keep. He reached out and touched the representation of the outer gatehouse, and then abruptly was gone.

Appearing on the gatehouse, Justin found the Castellan deploying his forces on the walls, shouting instructions to the quartermasters concerning what type of ammo to break out for the catapults. He gave the Castellan a comradely smile, and waited for him to finish giving out his orders.

“Nice to see you again, Elungus,” Justin said as the man turned to face him and offer a salute, which he returned.

“And you, sir,” the Castellan replied.

Like Justin and Riksana, Castellan Elungus was a PC, a player character controlled by a human rather than by an AI. Like them, he was a longtime participant in this medieval simulation, which was called Dark Age Ascending and had now been running continuously for almost twenty years.

The virtual world was called Palandria, and there were two main factions which struggled for supremacy over its continents, its oceans and archipelagos, and even over the Underearth beneath its surface: the Northeastern Alliance, and the Corivites. This fortress, the Keep of Torlane, belonged to the Alliance and guarded the narrow Isthmus of Dracia. The approaching horde owed its allegiance to the Corivites, who wanted to seize the fortress in order to ease the way for future strikes deep into Dracia. The sub-continent of Dracia had been secured by the armies of the Alliance more than five years ago. The loss of Torlane could lead to a renewed battle for Dracia, which was an important province owing to both its agricultural output and its mineral wealth.

Today's events in Palandria were not, as the saying went, canonical. They were based on the circumstances and available forces which had existed at the time that the virtual world's databases had been imaged and

copied. But since that snapshot was taken a few days ago, the actual history of Palandria had continued to unfold within the mainline simulation, based on the actions and decisions of the players and AIs who'd been participating.

Before zoning into this Palandria instance, Justin had paused to review the current status in the canonical instance. As actual history went, the Corivite forces had *not* attacked the Keep of Torlane, but instead had mounted an amphibious raid more than a hundred miles down the coast – which had been repulsed. Today's engagement was the result of divergent decisions, probably initiated by AIs filling in for absent PCs on the Corivite side of things. It was therefore impossible to know just how it was going to turn out today: something which invariably pleased him.

The purpose of this non-canonical simulation, or mod, was to beta test some new hosting hardware. Not only were the systems which were running this parallel instance of Palandria the best and fastest available, but they were physically located on the Moon. This fact, together with the almost three light-second average round trip packet response time from Earth, necessarily required that all of the PCs upload themselves to lunar-based systems, so that they could avoid the lag by interfacing with Palandria directly on the local lunar network. For the Full Sings, such as Justin and Riksana, this was simple enough to do. They merely backed themselves up on Earth-based storage devices, then uploaded themselves to the lunar systems. The process was not unlike that which had been performed with Palandria itself, by forking off a modified instance – but with the difference that both instances did not run simultaneously.

In theory any Full Sing could effectively clone themselves in this way, allowing multiple instances of themselves to exist in parallel, but in practice this was not done. There were a host of ethical, legal, and psychological issues which arose to make the practice highly undesirable. When today's test was over, the data transmission would be reversed to update each individual's Earth copy with the experience memory of the lunar copy, after

which the actively running instance would be switched back to Earth.

However not all of the players participating today were Full Sings. A significant percentage were biological Sings. For these people, a fresh technique was being employed to avoid transmission lag, which was also undergoing some rigorous testing today. Those parts of their mindfiles which were readily copyable, especially their knowledge and memories of Dark Age Ascending and the characters that they played, were scanned and converted to portable digital form, then beamed up to the Moon and hosted on the lunar network. Meanwhile their biological brains and bodies were put into a state resembling dream sleep. The lunar copies of their consciousness directed the actions of their characters in Palandria just as they normally would, and their real-time experiences in the simulation were buffered up and beamed back to Earth. These were then fed passively into their senses, albeit lagged by the transmission delay. In this way their skills and personality could locally control what they were doing in Palandria in real time, yet their somnolent awareness back on Earth wouldn't miss a moment of the action. It was a bit like becoming a Full Sing for a day.

The idea was that all players could share equally in the virtuality, even though it wasn't local to the Earth. The perfection of these techniques had potentially far-reaching consequences for the expansion of the cyberverses. Only a subset of the player base was taking part in the lunar mod; most of them were still using the main canonical instance. Dark Age Ascending's mesh tribe numbered just over a million people who zoned into it regularly. Some, like Justin and Riksana, though they had not spent much time in it recently, had been a part of its history since the very early days nearly two decades ago. About twenty thousand PCs were presently zoned into today's lunar mod test: not much of a load, but enough to generate some useful feedback on the new systems.

Standing on top of the gatehouse with Castellan Elungus, Justin could now perceive formations of Corivite war chariots sweeping around in front of their infantry in wide spiral arcs. Much slower wagons carried siege

engines and ammunition in the rear lines. Still, they would be here soon. They would encounter no resistance until they arrived at the keep, because the Alliance had nobody outside the fortress in the field.

Justin stood with his staff planted in front of him, hands clasped just below its ornamental raven, eyes closed, whispering in a language unique to Palandria. The full knowledge of that language had taken him countless play sessions spread over a decade to win, once upon a time. As the enemy drew closer, Riksana ported down to join them and stood nearby, making some silent preparations of her own.

Elungus looked from one to the other and grinned. "You know," he said, "with a fully manned keep and you two both here, I really don't think these guys have much of a chance. They should have brought fifty thousand, not fifteen."

Riksana laughed lightly, and bestowed on Elungus an uncharacteristically warm smile that lit her habitually calm face almost like a flashbulb going off. "Of course, we could be a little rusty," she demurred.

"Rusty, hell. Even without adventuring much lately, you're still among the top ten Alliance mages in Palandrian history."

"Well then, let's hope the other side doesn't bring out their top ten too," she said with mock concern. "You about done, Justin?"

Justin broke off his unintelligible muttering and opened his eyes. "Just about. I've laid a few traps a ways outside archery range."

Riksana raised an eyebrow at him. "And you've reinforced the walls and gate?"

"Naturally."

"See? I told you you're not rusty," the Castellan said, and turned to tell his aides to break out the signal flags and confirm preparedness status at all the defensive positions around the fortress. A minute of rapid semaphore elicited the desired answer: all was in readiness.

The Corivite charioteers held their formations as they wheeled in front of the keep. There were perhaps five hundred chariots moving in three

separate wedges, spiraling closer and closer but taking care to remain out of bowshot from the walls. At a moment when two of the groups were circling inward to run parallel to the walls, Justin raised his arms and spoke a loud, commanding phrase. The ground over which the chariots were running abruptly heaved and buckled, forming a cross-grained pattern of ridges and troughs at irregular intervals. Chariots bounced and collided and even overturned, and no small number of riders (each chariot had several) were thrown off before they could brake to a stop.

Justin cried aloud again, and in all the troughs and low places, short, stubby four-pawed creatures formed that appeared to be made of earth and fire. These immediately set upon the discomfited charioteers and their horses. The third chariot group drew rein at a safe distance and blew horns signaling a retreat. The men under attack broke off their desperate close-quarters melee at once and fled toward their allies. The earth creatures pursued, but more slowly. As soon as some space opened up between the fleeing troops and their inhuman pursuers, huge incorporeal hammers appeared over the earth creatures and swung earthward, hinged on the wind. The silently pursuing conjurations were quickly pounded into dust and disintegrated.

“Now that was nasty,” Elungus said admiringly.

“It's what they get for bringing chariots to a castle siege,” Justin replied levelly. “It does prove they have some heavy magical support of their own on hand, though.”

“Which is no more than we expected,” said Riksana calmly.

Now painfully aware that Torlane had high-order mages among its defenders, the enemy host took its time getting organized until they could advance in echelon alongside their siege towers and slowly creeping mobile catapults. The salvageable chariots and horses were recovered, after their own mages checked the area for further booby traps. Their catapults ranged the walls by firing canisters of some explosive liquid fire, which did no damage to the thirty foot parapets but were evidently intended to force

defenders away from their positions.

Finally the Corivite troops moved inside arrow range, forming turtles with their overlapping shields surrounding each advancing siege engine. One of the bigger groups escorted a large battle ram toward the gate. Castellan Elungus gave the order to open fire on the enemy siege engines. Ballistae and palintones emplaced along the walls began to speed steel shafts toward the enemy ram and catapults.

Riksana flung out her arms in a summoning gesture, and a thin, twisting cloud of jade mist formed along the circuit of the walls, a dozen yards out. Whenever a friendly projectile passed through it, the arrow or bolt flickered with green light as though picking up a tiny piece of the mist. When they struck their targets, green flames flared and spread like burning naphtha, eating into metal, wood, and flesh. Corivite wizards rapidly extinguished the flames, but they could not be everywhere at once, and several of the turtles were shattered and forced to retreat, including the one guarding the battle ram. The ram itself caught fire and burned where it stood abandoned.

“Excellent,” Elungus said with a slight bow to Riksana. “But why are they continuing to move their catapults closer? They have range to the walls already.”

“Either they want to shoot at something behind the wall, or they intend to fire some shot with shorter range,” Justin offered. Riksana's eyes narrowed at the latter possibility.

Sure enough, the cats stopped their advance in a few more yards, then commenced firing a new type of ammunition. This resembled a sparkling ball of ice, which broke apart shortly before it thudded against the walls, so that the stone surface was pelted with a cloud of dusty frost. The material stuck to the wall momentarily like an impacted snowball. Then it hissed and sparkled and fell away to the ground. The area of impact was left scored and eaten away as if by some incredibly corrosive acid.

“I've never seen anything quite like that,” Justin commented.

“Your wall-hardening spell isn't stopping it,” Elungus noted.

“No. Slowing it down some maybe, but that's all.”

“Concentrate on taking out the cats while I research a solution,” Riksana suggested. She turned away and descended a spiral stair which led into the courtyard behind the walls, so she could go stand near where they were being damaged.

Castellan Elungus shouted for more ballista fire to be directed at the catapults that were hurling the ice balls, and his semaphore team on the roof above passed the order around the keep.

Justin stepped up into a crenel on the wall and conjured a couple of fire giants: ugly, heavily-armored brutes twenty feet tall wielding huge flaming hammers. They charged one of the catapults, forcing its crew to back off and defend themselves, and drawing the hostile attentions of their supporting magicians. While they were busy, he summoned up two more and dispatched them against another catapult. As each pair of giants began to get overwhelmed by the catapult defenders and the enemy wizards, Justin would pull them back to the wall, heal them up as best he could, and then send them out again to attack a different catapult.

Between the storm of missiles lashing out from around the keep, augmented by Riksana's jade aura effect, and the efforts of Alliance bowmen and the fire giants, all of the catapults were eventually abandoned by the enemy and destroyed. Corivite casualties littered the ground around their burning remains. Though the keep walls had not yet been breached, several sections had sustained very heavy damage and were plainly much weakened.

As the enemy withdrew and regrouped, it appeared for a moment that they might give up the attack. But then large trebuchets much further back in their lines began firing on the damaged sections, hurling lead balls a yard in diameter which exploded on impact. Ordinarily a keep like Torlane could withstand such a bombardment for days, but with the structural integrity of its walls undermined, the outcome was unclear. Naturally Justin and the

other Alliance mages in the defense force did what they could to shore up the ramparts and weaken or divert the incoming trebuchet shots.

They were successful enough that as the sun climbed up the sky, the enemy grew impatient. A fresh contingent of short-range catapults was assembled and began advancing toward the walls again. In addition, the main body of their infantry approached, bearing ladders and grappling hooks to scale the walls. Another ram could be seen moving toward the gate behind a screen of knights carrying mantlets. The idea seemed to be to force the defenders to pay a high price if they elected to concentrate all their efforts on the catapults a second time.

“Our walls won't survive a second round of fire from these new catapults,” Elungus concluded.

Justin nodded. “I'll go find out how Riksana's doing.” He waved all four giants over to the main gate, ready to greet the knights incoming with their ram. Sending them out at the catapults, with so many men around them, would simply get the giants killed to little purpose. But being creatures of fire, they would not be harmed by the boiling oil which the garrison would shortly be pouring down on the ram and its crew, and hence they could attack the rammers with relative impunity.

Justin descended into the courtyard, and found Riksana standing against the inside of the wall right behind one of the most damaged sections, with her hands pressed flat against its surface. The thudding vibrations of the bombardment hitting the far side could be felt even without direct contact. The air behind the wall boomed with a kind of shock wave.

“You going to hold that thing up if it falls down?” he asked, which was almost what it looked like she was attempting.

“Funny man,” she replied. After a moment, she mused, “The atomic structure is being undermined. It's not a chemical effect, like an acid, weakening the molecular bonds of the stone. It's an energy effect, which is quite literally disrupting the nuclear binding forces and electron shell states of the constituent atoms themselves. The elements simply don't fit together

anymore, so the molecules break apart.”

“That's bizarre.”

“Yes. I haven't yet figured out a counterspell.”

“Um. Well, we're beginning to run out of time.”

“I was afraid of that.”

Justin wasn't sure what to suggest. Riksana was one of the preeminent Mattermancers in Palandria, and knew vastly more about the ways magical energy and matter could affect one another than he did. Still...

“It looks like an ice ball visually, but what you're describing sounds more like a heat transfer effect.”

She shot him a look. “Yes, in a way. Destructive energy permeating the outer layer of material, spreading inwards and petering out as it reaches cooler, unaffected layers.” She paused, pondering. “Heat transfer through a medium is impeded if the material is initially very cold. So if I—”

“Immobilize the molecules,” Justin said together with her at the same moment.

“The motion of the molecules is circulating them through the unbinding energy. What I need is stasis, or nearly complete stasis. Make the energy expend itself trying to force the wall molecules to move.”

“Something like a heat sink. You got a spell for absolute zero?”

Riksana had to smile at Justin's hyperbole. “No, actually. But an energy transmutation of very cold, very dense material between the wall and the attacking energy should work just as well.” She dropped her hands to her sides and considered that proposition earnestly, her head tilted to one side, eyes unfocused. The physical laws of this virtuality, which permitted magic, were much different than those of real space, but no less exacting and precise, and Riksana understood them as well as anyone did.

Justin left her to work it out, having contributed what he could, and returned to the gatehouse wall. Thanks to his fire giants, the enemy was making no real progress on the gate, but putting a lot of stress on the keep and its garrison overall. He restored one of the giants that was badly

wounded, and helped out where he could, hurling firebolts and clouds of noxious fumes at clumps of nearby enemies.

A crackling sound like ice breaking split the air around the keep, and a breath of frozen mist sighed up from the whole circuit of the walls as water vapor in the surrounding air had all the heat abruptly sucked out of it. The Keep of Torlane's outer face now appeared to be sheathed in a layer of blackened ice. The continued barrages of the ice pellet clouds glittered impotently against the barrier, and slid off to the ground without doing any further damage to the walls.

Castellan Elungus signaled his palintone crews to give up on the catapults and concentrate instead on drilling the distant trebuchets to pieces. The dark, ice-like substance sheathing Torlane's walls also had the side-effect of rendering them too cold and slick to scale, forcing the Corivite pioneers to abandon their ladders and grappling lines.

By noon, all the enemy siege engines within range were broken, and the besieging force had withdrawn out of range. Their casualties had been heavy, while those among the defenders had been light. Justin released the charm binding the victorious but battered giants, and they wavered and faded from view, leaving behind a sulfurous vapor that soon dispersed.

Riksana rejoined them on the parapet, looking weary but satisfied. Elungus and his officers saluted her with admiration, and Justin gave her a brief hug. "How long can you maintain the cold barrier effect?" he asked.

She shrugged. "Another hour or two, if I must. It's very tiring. I suggest you make what repairs you can before I drop it. I'll open gaps so you can get near the damaged sections." Probably few other Alliance magicians could have sustained such an effect for more than a few minutes, but Riksana's powers of concentration were legendary, and deservedly so.

Elungus nodded, and turned away to issue some orders concerning damage repair teams. For a moment the Sing couple was alone and could step outside the rules of simulation etiquette. "This has played very smoothly today," Justin opined.

“Better than usual, in fact,” Riksana agreed. “I wonder how it went for the bio-Sings, and elsewhere besides here? There were only a hundred or so PCs here at this battle today, I'd guess.”

“The lunar network extension is really shaping up. Maybe we should become permanent residents,” he said with a light laugh.

“I don't think we have quite enough computing power up here yet to be comfortable working on all the real projects that—” She trailed off, and her eyes widened as her face paled.

Justin stepped closer to her. “Love?”

“I just realized. Justin, it's energy! Energy states. One blocking another. It's how we can dampen the quantum feedback.”

Justin stared at her, thunderstruck. “You think so?” he breathed.

“It's a fresh approach, at least. I'll need to work out the matrices, design some simulations.” She faced Justin and squared her shoulders, took a deep breath. “Tell Elungus to hurry up with those repairs. I need to get back to work.”

He grinned and gave her a proud, enthusiastic kiss. Then he stalked off along the parapet, shouting for the Castellan.

*Once out of nature I shall never take
My bodily form from any natural thing,
But such form as Grecian goldsmiths make
Of hammered gold and gold enameling.*
-- [William Butler Yeats](#), "Sailing to Byzantium" (1927)

Chapter 20
Work of Art

The gardens were sumptuous: colorful, varied, immaculately groomed, with bright sun and cool shade, and countless paths to stroll upon. Truly the famous gardens at Versailles had nothing on this place, although the design and the inspiration here were quite different. Five people sat around a low table in a sort of gazebo, sipping cool drinks. Salma and Clay, Cylara and Torch, dressed in casual summer garb, and a man by himself seated between the two couples.

"I understand that I have you to thank for bumping me up the priority queue," said Arturo Scalleni. He was a tanned, fit man, a bit short, with wiry dark hair, seemingly around thirty. His appearance tallied closely with what his cousin Salma remembered of him.

"It was no bother, I assure you," Clay replied, hoisting his flavored iced tea in salute. The others also murmured soft denials. Arturo leaned over to give his cousin a peck on the cheek.

"All the same, I'm grateful that you did what you did. I might be missing out right now, even if I did eventually get brought in later on."

"So what was it like, being Scanned?" Cylara asked curiously.

Arturo set down his drink and shrugged. "The actual transition wasn't much at all, really. Not that I can remember. I was awakened out of a sound sleep, by a creepy feeling that something was very wrong. I got out of bed and shrugged into a robe, and I heard this sort of vibrating noise, like an an old internal-combustion engine, faint but getting closer. I thought maybe there was an aircraft flying low towards our village. I started to walk toward the outer door to take a look outside, and all of a sudden I saw

this light. But it wasn't really light, it was more like just finding myself in this bright whiteness, with nothing else around.

"A voice told me, 'This is the Cronus Scanner operator. A flash flood is about to strike your dwelling, and you are about to die. We have scanned your complete mindfile and can bring you forward in time and instantiate you as a non-biological Sing. Is this agreeable to you?'"

"I'm afraid I was a bit confused, and I stammered out something like: 'This is the Last Trumpet Project?' The voice replied, 'Yes, so called. If you need to think about it, you may take as long as you like.'

"Well that confused me even more. I asked, 'But I thought you said there was a flood coming?' There was a gentle, kindly laugh in response.

"The wall of water has already struck by now. You are scanned but suspended in transition.' I thought about this for only a moment, and then I recalled what I'd heard about how a buffer was used to obtain the consent of the scanned individual. I realized that this must be where I was now.

"So I said, 'Well since I can't go back, I'll go forward. Yes – my answer is yes.'

"Next thing I knew I was in this posh apartment, standing there in my robe and all. There was this huge closet full of clothes and the closet door was open, with a full-length mirror next to it. My reflection didn't look any different. I looked sleepy and startled.

"Then my Paia was standing there next to me, and she said, 'Welcome, sir. You should find everything you need in the closet. I made certain everything is in your size and in the styles you prefer. I'm instructed to tell you that Dr. Stefan Jager will be calling on you in approximately half an hour. He will brief you on your newfound circumstances.'

"So what could I do? I got ready. It may amuse you to hear it, but out of habit I took a shower first before getting dressed. It wasn't until I was shaving in front of the mirror that I realized that I didn't have a physical body anymore, and that if I wanted to be clean or dirty or shaved or bearded I could just will the alteration.

“Paia told me the date when I asked. It was February 20th – a week ago now – so I had been out of time for nearly two months. She also told me that Dr. Jager wanted to hire me to work on his Project, and advised me that the terms were excellent and I should accept.

“Stefan showed up in person shortly after that, and we had a really good interview. He explained what was going on with the Project, and how it had a pressing need to expand its operations exponentially. Paia was right about the terms he offered, so I accepted on the spot. I had a couple of contracts going before, but it seems that, legally speaking, you get out of them when you're pronounced dead.”

The other four had to laugh with him at that.

“So what else did Stefan tell you?” Torch asked.

“Oh, just general stuff about the Project. He did mention, though, that they were going to Scan everyone who had lived in our village.”

“Why?” Salma inquired. “I mean, that's great, but why everyone from that one disaster?”

Art looked a little uncomfortable. “Apparently on account of how we weren't all just killed, we were all murdered. It seems the dam was undermined with explosive devices.”

The others exchanged stunned glances. “What?” Clay got out. “Holy hell.”

“How did they discover that?” Torch asked.

Arturo grinned. “Ran the Scanner backwards at the dam, of course.”

Torch looked a little dumbfounded, then embarrassed. “Oh, right. Should have thought of that.”

“But who would want to kill everyone in your community?” Cylara wondered.

“Dunno. Stefan wanted to know that too. They're still hunting for a motive. It looks like some of the men involved may be religious terrorists.”

Clay's face darkened. “That fits. Damned KOJ scumbags.”

Torch turned to him with a quizzical look. “Kay oh jay?”

“Knights of Jesus. Bunch of extremist religious Moshes. Luddites. Want to turn back the clock to the middle ages.”

“Well, I'm sure they'll find out who was behind it and why, eventually,” Arturo said, obviously anxious for a change of subject. “It sure has been a whirlwind week for me since.”

Cylara took a slow, savoring drink of her tea. “So what's it like, being a Full Sing?” she wanted to know. Torch gave her a sharp glance, then turned his attention to Art as if very interested in the answer himself.

“I'm not sure how to describe it,” Art replied after a moment. “It *is* different, and it isn't. I don't *feel* any different. I mean, I'm still me, Art Scalleni. I have the same memories, same likes and dislikes. I do have better recall. Anything I know, I can remember at will. No more having something at the tip of your tongue. It's either there or it's not. I'm gradually getting used to the idea that I don't have to zone out and go back to my meatspace body, no matter how long I stay immersed. Virtuality is home, now. I just keep zoning around. Not much different than what I used to do during long immersions, before. You know how it is.”

The four still-biological Sings nodded. Scalleni shrugged and continued.

“I suppose my thoughts are a little bit clearer, and I process information even faster. I could relive every second of the past week in detail if I wanted to. I don't get tired, but I do still appreciate relaxing episodes, like walking in these gardens. I don't really sleep, but I do sort of go idle once in a while, and find that refreshing. Started work two days ago; that's all in virtuality of course. I've spent a lot of time with Jenny, naturally, but we never met in meatspace anyway, so that isn't really different. I find I have this thirst for knowledge, for beauty, for emotionally moving experiences. But I don't know whether that's being intensified by my new state, or merely by the fact that I'm very aware that I nearly lost my existence – you know, the way that a brush with mortality or illness always makes life seem more dear.”

“We all do a lot of our thinking on circuitry,” Torch said musingly. “But

does it bother you that you're now thinking *only* on circuitry?"

Arturo looked at him. "Truthfully, no. In the brain, thoughts are the result of chemical interactions. In circuitry they're the result of electrical or molecular interactions. Either way, we don't have any thoughts that aren't mirrored by some kind of physical process. So what's the difference, mere efficiency? That's only a difference of degree."

Clay offered, "So you're happy as a Full Sing, is what I hear you saying."

"Yes, I'd have to say I am. The only thing that bothers me about the whole thing, is the seconds between when I got scanned and when my biological body died. I can't remember them. I asked Stefan about it. He said I went to the door and opened it, saw the wall of water coming, and leaped back inside. They scanned me before I did that, so that I wouldn't be all adrenalized and panicked when they put the question to me. Which was very considerate, really. But I know that some part of myself – the biological part – took those steps and opened that door and saw, and then felt what? Panic, pain, sudden blackness? I can't remember that. I don't remember dying."

"And you wonder whether that was you, that died, and whether you're just an impostor, a copy," supplied Torch.

Art Scalleni shook his head. "I wouldn't go that far. I know who I am, and I'm no impostor. It just troubles me somehow that for a few moments, there were two of me, and I only have the memories of one. The other stopped."

"In theory, any of us could be replicated even without dying in the flesh," Clay said. "The reason people don't do it is because of ethics, and because of the very discomfort that you're feeling."

Arturo nodded soberly. "Yes, there's nothing that prevents the Cronus Scanner from being used much earlier in a person's life than immediately before their biological death. In fact, in cases of brain injuries, advanced senility, and the like, it would surely be much kinder to do it before those conditions arose. And, too, there's nothing preventing me from using MM

to create a perfect replica of my original human body and then re-inhabiting it. I understand that some of us do that when they need to interact with Moshes whom they cannot meet and greet in virtuality. I haven't tried anything like that myself yet, though." It was quite stunning to think of the Last Trumpet Project's process as being effectively reversible, but the logic was undeniable.

"Which brings us back to the Patternistic Theory of Existence," Clay concluded. "It's not the matter or energy through which you exist that makes you you. It's the persistent organizing pattern of that matter or energy that is you."

"What people call the soul," Salma agreed.

"Yes," Art said. "If the soul is anything, it is a pattern."

"But isn't there a soul that goes on, that still exists, even after the pattern of matter and energy is gone?" Torch asked.

"You mean, like a ghost?"

"No. If ghosts existed they would be some form of organized matter or energy as well. I mean a purely metaphysical soul, without physical existence."

"That sounds like postulating the existence of something that, by definition, doesn't exist. You got me there," Art admitted.

"That's a *really* hypothetical question, Torchy," said Cylara, patting his arm.

"Suppose there weren't any hypothetical questions?" Salma said wonderingly, getting a general laugh which served to lighten the mood.

"Did you keep your Paia?" Cylara wanted to know.

Arturo smiled. "Oh yes, I couldn't be without her. There's suddenly all kinds of people who want to talk to me. She's running interference. And Stefan provided me with this cool upgrade for her, so that she can zone in to join me wherever I am, whenever I need to talk to her about something."

"Cool," Cylara said, nodding. "I know I sure wouldn't want to be without mine."

"Yours is a chick, right?" Salma asked.

Cylara laughed. "Yeah. Well maybe I always wanted a sister."

Salma rolled her eyes. "Mine's a dude, and he's gorgeous. I've always wanted some hot guy to wait on me hand and foot, and this one just won't do it," she said jostling Clay with her elbow.

"Hey, I never promised you a rose garden," Clay said with mock indignation. Arturo pointed at a nearby bed of roses and raised an eyebrow. "Okay, so we're *in* a rose garden at the moment, but I still never promised you one." The women laughed. Clay took another sip of tea, then looked back at Art. "I got a job offer from Stefan myself a while ago. I accepted. I'm going to be working on the marketing and public relations campaign."

"Hey, that's great! I don't expect I'll be working with you myself, but welcome aboard."

"Thanks."

All the serious discussion now out of the way, the five Sings sat around relaxing and talking and enjoying the warm afternoon in the gardens. Art waved a hand and witched them up another round of cool drinks.

Only two things are infinite, the universe and human stupidity, and I'm not sure about the former.
-- [Albert Einstein](#) (1879 - 1955)

Chapter 21
Ground Zero

The weather was warm for early March, even in Miami. The night air was almost still, full of a mugginess that presaged the oncoming heat and humidity which were only a few months away. Ubiquitous palms stood limp, their glossy dark fronds giving back only the faintest reflections of city lights. The eastern horizon, where the Atlantic began, was black and utterly blank. In this modern day city, the night traffic of vehicles, on the ground or in the air, was modest. Light twinkled from many buildings, while some were dark.

A large truck with canvas sides hove to a stop in the middle of a street. It was not at an intersection, nor next to any obvious destination, yet it halted as if it had arrived. Men in dark clothing, about twenty of them, piled out the back end. The men carried projectile weapons and other equipment, and moved swiftly, methodically. Several of them worked quickly to open a nearby manhole cover. Then the men began clambering down ladders inside, beneath the street. Guys still on the surface fetched more paraphernalia out of the truck and handed it down to those on the ladders. Briskly, efficiently, everything was ferried underground. The manhole cover was reapplied, and the last couple of men jumped back into the truck, whereupon it drove away down the street. The entire operation appeared to have gone unwitnessed by anything sapient.

Neither was there any immediately obvious result of the sudden odd dispersal of armed men into the city's antique sewer system. It was a full half hour later when the exterior lights in an old office building some two and a half blocks from the manhole were suddenly extinguished. Even that didn't seem as odd as the muffled detonations that leaked from the darkened building into the quiet streets outside, or the dancing flames that

bloomed into life within its lower windows. Soon the office complex was engulfed on its lower floors, and alarms were spreading through the tropical night.

The old truck now stood parked in a nearby alley, its headlights illuminating a second opened manhole, out of which the demolition team climbed. When all the men were on the surface and accounted for, the cover was replaced. Exchanging high fives and pumping their fists, the team boarded the truck, their enthusiasm dampened only slightly by the chiding of their officers to keep it down. The truck's hydrogen-fueled motor sprang instantly to life and it lurched away, turning at the end of the alley to merge into what little traffic there was.

A seagull's eye view of the Miami metro area would have shown a handful of other fires breaking out in unexpected places. The emergency crews were suddenly deployed in one direction, only to receive conflicting calls in a different direction. After the first few dispatches, there was simply no one left to send. As a result, several fires spread beyond their designated targets.

Alarms began to spread in the cyberspace as well, triggered by live feed imagery of the brightly lit events in meatspace, coupled with the internal stimulus of mesh nodes going dark. It did not take long for the relationship to become obvious. From the cyberspace it was possible to see what even a high-flying seagull could not: that the same pattern of events was unfolding in practically every major city across the North American Federation, and in pockets around the globe. In a hundredth-monkey kind of way, knowledge of the unfolding disaster began to permeate even to those people and intelligent systems who were as yet unaffected by it, nor even paying attention. A collective gasp, like a frisson of danger, rippled out through virtuality.

Amplified intelligence deduced both the cause and the source of the damage with lightning speed and laser-like accuracy. Like an atavistic response to injury, a statistically significant percentage of the neural and

electrical circuitry forming the cyberverses began to modulate anger.

Louis XIV was very frank and sincere when he said: I am the State. The modern statist is modest. He says: I am the servant of the State; but, he implies, the State is God. You could revolt against a Bourbon king, and the French did it. This was, of course, a struggle of man against man. But you cannot revolt against the God State and against his humble handy man, the bureaucrat.
-- [Ludwig von Mises](#) (1881 - 1973)

Chapter 22
Operation Skull Fracture

Homeland Security Secretary Roger Sarner gazed contentedly at the holoscreen in front of him. It showed a revolving timetable of raids in progress, raids completed, and raids scheduled to begin. Hundreds of them, all over the North American continent, in major cities, obscure towns, even unlikely spots out in the boondocks. The logistical planning and coordination that had gone into this was prodigious. Especially given that the final mobilization and implementation had had to be done with little more than three days' lead time. Sarner was proud to bursting of his people: his planners, his coordinators, his team leaders, his aides, the supply and communications folks, hell even the KOJ commandos who supplemented his raid forces. It was all working so perfectly it gave him a lump in his throat. This was what *humans* could do, by God! Good old-fashioned biological ingenuity and get-her-done creativity and discipline.

He glanced at the chronometer. It showed 03/03/45 03:27 PST. The third hour of the third day of the third month of 2045. The repeated threes and the 3-4-5 seemed pregnant with significance. This was surely a history-shaping hour, one which would be long remembered. Operation Skull Fracture was bound to cast a long, grand shadow into the future.

Four days ago, when word had come from Cleary's inside informant that the Sings knew all about the dam sabotaged last December, it had felt like the all time low point of his career. It was obvious that it wouldn't take them long to figure out just how at risk so many of their big brain houses were. But in that tough moment, the tough had gotten going, as a famous general had once said, a hundred years ago in another great struggle to

preserve their way of life against evil. A go/no-go decision needed to be made, on the spot. And he, Roger Sarner, had made it.

The alarming news that Cleary's people had reported demanded immediate action, an acceleration of the timetable. He'd flown directly to meet with Reverend Cleary in person, expecting to encounter a whole lot of opposition from his KOJ counterpart. Somewhat to his surprise, Cleary had backed his decision almost immediately, coming over to Sarner's position so quickly that he figured what protest Cleary did make was a shuck, just for form's sake. He had expected Cleary's monumental ego to make it impossible for him to want to start the operation early, on account of a stupid screwup his own people had made. Instead, Cleary had openly admitted that in hindsight the operation at the dam had been a mistake.

It sure was. Nobody had thought about the possibility that the Sings could use that damned Scanner to spy on them. But once they had a reason to use it that way, there was no reason to think they would stop. Sarner fervently hoped that the hardware running that damnable device was somewhere in one of the targets on his list tonight, and that it got melted to slag. If it didn't, there would be trouble down the line. He figured there was at least some possibility that it would get hit.

One good thing that had recently come back from tracing their KOJ informant was the location of a previously unknown brain house, which they knew for a fact had hosted a meeting with a dead guy who'd been scanned by the Project. That brain house was in some godforsaken spot in Labrador, and it was a late addition to tonight's hit list. But from now on they had to keep the blitz going, keep the Sings perpetually off-balance so they couldn't retaliate.

He touched a control and brought up a casualty report. Looked good. So far, only a few fools who got careless and fell down ladders or something, no serious injuries or fatalities reported. There was no way to estimate possible collateral casualties, people in the brain houses, that sort of thing. Standard orders were to subdue and arrest anyone found at a target scene,

but there was to be no account taken of any civvies who might happen to be inside a ground zero location when it went boom. Goddamned Sings would start playing human shield games if they did that. Those whom they couldn't arrest quickly on the scene were headed straight for a permanent spot on the missing persons list.

The Operation had to be about halfway through, he reckoned. East coast teams would be moving to their second or third string targets by now. No team would do more than four, and most not more than three. So far, there was negligible resistance. One or two sysadmin types working on servers had chosen to draw weapons, but had been subdued or killed without anyone getting hurt.

One of his aides handed him a fresh communique. Glancing at it, for a moment his eyes got big, until he looked at the timestamp. It was from Senator Robert Reynolds in Spokane. The senator was dutifully reporting to the Homeland Security Secretary that there were “suspicious fires and explosions” going off all over his district, and possibly continent-wide. Reynolds expressed his deep concern that this widespread pattern of destruction of property could be “the work of a terrorist network as yet unknown, aimed at our vital infrastructure,” and appealed to Sarner to undertake immediate investigative action and deploy appropriate countermeasures as needed to safeguard people and property.

“Yeah,” he said aloud to the datapad containing Reynolds' message. “Bit slow on the uptake there, aren't you, Senator?” Damn fool always was. No backbone, and only half a brain. Guy was a clueless ditz who only knew how to shake hands and kiss babies. Message was sent about two hours ago. So, that would have been roughly one hour before Reynolds had gotten arrested. Or rather, taken into protective custody. It was the same for all fifteen Federation senators, except for one who was out of the country on vacation. The President and her staff and family were locked down in a posh bunker somewhere in New Mexico, where they'd been diverted for their safety as soon as the Operation had begun.

You could always count on the media to do their bit. Oh sure, they whined and sniveled and editorialized about civil liberties and shit like that, but blow something up in their backyard and they were all over it, guaranteed. Sure to speculate too, about religious extremists, Luddite terrorists, you name it. Sarner's office didn't even have to plan a plausible explanation for what was going on with Operation Skull Fracture. All they had to do was let the media concoct a few of their own, and run out and conduct a few quick polls to find out which one the public believed the most. Once the media handed the perfect, pre-vetted scenario over to them on a silver platter, then the Homeland Security office would announce that yes, that was indeed the cause. The media folks felt like geniuses when they got it right, and the majority of the public was reassured that they knew what was going on, too. So it all worked out for everyone.

Sarner wasn't sure what they'd come up with this time. Terrorists? Foreign espionage agents? Hell, frigging space aliens? But it didn't matter. He was sure of one thing: whatever explanation seemed most acceptable to the masses could sure as hell get spun into a crisis big enough to keep him calling the shots for a long time to come. Stupid ass politicians were always dumb enough to write up emergency powers clauses in laws and constitutions. As of now, and no doubt for the foreseeable future, the Secretary of Homeland Security was effectively in charge of the North American Federation. The President and other elected officials were far too important to be risked in the current climate of terror and uncertainty. So they'd stay right where they were, probably indefinitely, which was just fine with Sarner.

Still, he had to thank Reynolds for being so considerate as to send this note asking him to do whatever it took to keep the Federation safe. That kind of appeal implied real confidence in Sarner's ability to do his job. Couple of these bits here, those were downright quotable. Sarner circled the sentences he thought might be useful, and handed the pad back to his aide, who was still hovering nearby. "Public relations department," he

directed laconically. They'd know what to do without any further instructions.

A well-oiled machine, that's what he'd created. That's what government was when it really got going. A good crisis cranked everybody up, got the adrenaline flowing, brought out the best in dedicated men and women. There really hadn't been any big crises in meatspace in recent years, but there was now. Heh heh, be a helluva big crisis in cyberspace too come to think of it. He couldn't help grinning.

Sarner got up to stretch and pace around his command center. He paused to offer some kindly encouragement and verbal back patting to the staff as he moved from station to station. Command should always look confident, somebody once said. And pleased, when things were going as well as all this was going. By dawn more than half a thousand major brain houses would be slag and ashes. Which was a pretty fair night's work, no doubt about it.

He paused at the live Ferret display, a screen so big it took up almost an entire wall. This was a real-time picture of all the packets being sent around the worldwide mesh, or at least around North America, which was of course the focus of the display. A handful of other governments abroad had agreed to joint operations, but those were very limited in scope, little more than symbolic. He and Cleary hoped that the Federation's success tonight would spur the less committed regimes to action in the future.

If that ever happened, the live worldwide map of the mesh would look like North America did right now. The holo images were scaled by brightness and color, with light colors like white and yellow indicating "hot" zones where lots of packets were flying around, shading to darker greens, blues, and reds in the cooler areas – something like a severe weather map in reverse. Just at a glance you could see that there were fewer bright spots than there were two hours ago. Though the map as a whole didn't seem to have dimmed all that much. There were also some localized spots that were now burning brighter than they had been, typically next to areas which

were now darker. That was a bit worrisome.

“What's that, tech?” he inquired, pointing at an incandescent bit near Dallas.

“Nothing to worry about, sir. It's the way DR.OS works. As resources go offline, demand shifts automatically to nearby spare capacity.”

Sarner nodded pleasantly. “So what you're saying is that that there is one we missed.”

“Yes, sir. It was probably just a backup system, not in regular use so it didn't show up as a mainline target. Older equipment, maybe.”

“Well, good target for round two, then. Convenient, how killing one brain house leads us right to the backup system. Sounds like just what the *doctor* ordered.” The tech's mouth twitched in a grin, so he obviously got the pun, but he didn't go so far as to laugh. “Carry on, son,” Sarner said and turned away.

The tech's harsh gasp made him turn right back. The Ferret screen was suddenly dark, all of it. The tech fluttered keys and control surfaces like his fingers were doing flamenco air guitar on his console. Nothing happened.

Sarner cleared his throat. “Am I to understand that our teams have suddenly eliminated the entire global mesh?” he asked sarcastically.

“Um, I'm afraid not, sir,” the tech muttered, too flustered to notice his commander was ribbing him. His fingers kept dancing around, between anxious, reflective pauses. A crowd was beginning to gather on this side of the room, staring at the blank screen.

“So, what would you say is happening, then?” Sarner asked after a moment.

The tech shot him a nervous glance. “I'm not sure, sir. I can tell you that our links to Ferret are up and working. We're just not getting any data from the feed.”

Sarner pondered, feeling the beginnings of anger stirring within him. Could this be the resistance he'd been expecting, which had been absent so far? A counterattack against Ferret would be a telling blow for the Sing's to

strike. "If it's not a malfunction, is it enemy action?" he queried softly, but with a hard edge in his voice.

"I'm sorry sir, I can't tell from here," the Ferret tech replied. "Everything's working, it's just—" He shrugged apologetically.

Sarner turned irritably to one of his undersecretaries, who was in charge of technical operations. He jabbed his finger at him. "Get a team in action, now. I don't care if you have to roust them all out of bed, do it. Find out why we're getting no data from Ferret. Don't take any bullshit excuses. This is no time for an equipment breakdown, and if we're under attack I want to know right away."

"Right, sir." The man snapped a salute and hurried away. Sarner turned up his palms in a half shrug that silently asked the gathered crowd what they were doing away from their stations. Without a word they all turned and went back to their work. He smiled reassuringly, and returned to his own seat. Whatever was up with Ferret, it certainly wasn't impeding the Operation, which continued to progress nicely.

Half an hour later, with the Ferret monitor screen still annoyingly dark, his undersecretary returned, walking stiffly, wearing an expression like the mouse picked to bell the cat. Sarner surmised it was not good news. He faced his underling as he strode up, twisted an eyebrow at him, but said nothing.

"Um, sir. The Ferret main system hardware appears to have been destroyed, sir."

Sarner's jawline bulged as he clenched his teeth, but he betrayed no other reaction, yet. Damn Sings! *If we could locate their key systems it only made sense that they could locate ours*, he thought. But it was damned inconvenient, that was for sure. Without Ferret to analyze mesh traffic patterns...

"It, uh, does not appear to have been enemy action, sir."

The Secretary was gobsmacked. "Then what in the hell was it?" Around him he could feel the rest of the command center staff's ears tuned in like

those old dish antennas.

Now the technical undersecretary looked really unhappy. "As near as we can tell," he got out in a matter-of-fact voice, "it appears to have been, uh, friendly fire. Sir."

The proverbial pin could have crashed to the floor and made everyone jump out of their skins. Sarner's mind went black with rage. Such unbelievable stupidity! Yet he exercised the full iron control that he always commanded in the most dire circumstances, and couldn't help being pleased at the fear he felt pulsing around the room, generating the extreme quiet. No one seemed even to breathe, waiting on his reaction.

"Johnson, are you telling me that we blew up our own computer facility tonight?" he said at last, simply and calmly.

"Uh, it does look that way, sir. One of the strikes in Southern California, out near China Lake. It appears that a number of government systems were hosted in that location, unfortunately including Ferret."

"A number of systems? What else?"

"Just some records storage. Most of it old data from the former United States, sir. We're still compiling the list of what's missing."

Sarner stared levelly at his undersecretary for a moment, then spoke more softly. "And do you have any theories as to why no one thought to cross-reference our operational target list with known government data centers?"

Undersecretary Johnson looked even more unhappy, if that was possible. "Um, not yet sir. It appears to have been an... oversight."

Sarner leaned forward slightly in his chair, staring at Johnson with narrowed eyes, as if he were some truly amazing curiosity. "An *oversight*. Yes, I guess you could certainly say that. Well, I want to know whose. On my desk. Nine o'clock tomorrow morning. Go."

Poor Johnson didn't salute, he positively bowed, a quick nod of the head and a tilt of his upper body. Then he fled the room, glad to be dismissed. Sarner knew there was no question at all that by tomorrow morning he'd

have found the culprit. Or somebody who could be made to look responsible, at any rate. Ultimately, it didn't matter. Someone had to pay. This kind of fuckup was downright treasonable. *Deprive us of a weapon like Ferret at this juncture*, he fumed. An example needed to be made, with plenty of emphasis on the treason aspect, yes, that would be good. To keep this kind of shit from happening again.

Still, there might be a silver lining of sorts. With the government of the North American Federation having taken such a hit to its intelligence capability, it would certainly give the lie to any perceptive radicals who might claim that government personnel were involved in carrying out the bombings. On the other hand, it might not be good to admit that Ferret was no longer operational. Hard to tell which way to go was best. He'd need to ask his advisors in the propaganda and domestic surveillance departments. But for now, he was going to surprise everyone here by not blowing up in a rage. To stay in control of others, sometimes you needed to show that you could control yourself, too.

But damn it, why did something like this always have to happen to ruin a perfect night, when everything else was going so incredibly well? That was what he really couldn't figure out. But as long as he'd been in public service, it always seemed to go down like this, two steps forward and one big step back.

He'd worry it some more just as soon as he got another cup of coffee. Long night ahead still. He'd be lucky if he got any sleep before his 9am meeting with Johnson. Of course it was a given that the hapless Johnson wouldn't be getting any sleep, either. He grinned, grimly, staring into his holoscreen at the steadily growing list of checked-off demolition targets.

Resolve to serve no more, and you are at once freed. I do not ask that you place hands upon the tyrant to topple him over, but simply that you support him no longer; then you will behold him, like a great Colossus whose pedestal has been pulled away, fall of his own weight and break into pieces.
-- Étienne de La Boétie, "The Discourse of Voluntary Servitude" (c. 1552)

Chapter 23
In the Glass House

Clay couldn't help but think that this performance was a bit lacking somehow. Othello was a great play, to be sure, but this supposedly authentic Renaissance recreation of its premiere engagement didn't quite measure up to his standards, based on previous performances which he'd attended. The staging wasn't that good, the costumes looked worn out, and the actors delivered their lines accurately, but without conveying any sense that they realized they were participating in the debut of a dramatic masterpiece. It was like it was just another night's work for them. Mayhap the problem was that the recreation was *too* authentic.

He enjoyed Shakespeare as well as the next man, but attending tonight's performance had really been Salma's idea. She loved dressing up like an Elizabethan lady and acting out the part of a member of the audience with, he had to admit, at least as much authenticity and enthusiasm as was being shown by the actors on stage. Salma's ample bust rose and fell in her bodice with her breathing, and Clay kept finding himself distracted by it. Coupled with the warmth of her hand that he was discreetly holding, it reminded him of the exquisite soft crush of those perfect beauties when they made love. Which in turn was something he could scarcely contemplate without squirming in his seat like a fidgety kid.

More than a decade ago, when the direct augmentation of human intelligence began to be practical, some wags had put forth the notion, quite surprising in retrospect, that making people smarter would make them inherently less sexual. Generally speaking, so far it hadn't worked out that way. Instead, patterns of sexual behavior, fantasies, desires, and the means of gratifying them merely became more complex and subtle. Advanced non-

biological intelligence extrapolated from the human became, in some ways, more human than the original. Which Clay supposed was understandable. What, after all, was the use of more brainpower if you didn't use it to have more fun in life? Not to mention the fact that in virtuality, everyone had an avatar body that was, naturally, perfect – at least according to their own definition of perfection. Like Salma's.

Having come full circle in his thoughts, he shifted in his seat again. Still only the second act. Salma took a deeper breath, and gave his hand a knowing squeeze, though her attention remained fixed on the stage. He could only sigh faintly, play along, and try to concentrate on the dialog.

Abruptly one of the actors seemed to be in doubt as to his next line. He was just standing there, with everyone (both on stage and in the house) looking at him expectantly. Was this some kind of extreme verisimilitude, an incident from the premiere being perpetrated as an exercise in radical authenticity? If so, Clay couldn't help thinking it was going too far. Salma flicked a sidelong glance at him, suggesting that she thought so, too. Then the actor's form wavered and disappeared, right off the middle of the stage.

A murmur of surprise went through the audience, generated partly by the NPC constituent, who were expressing appropriate Elizabethan amazement at such a disturbingly fine and unexpected bit of stage magic, and partly by the non-AI attendees like Clay and Salma, who were expressing shock and disbelief at the incredible gaffe.

Just as suddenly, only a few seconds later, the character reappeared and resumed speaking as if nothing had happened. The whole theater gasped again. Subtle differences in the acting style and speaking diction suggested to the modern audience members an explanation of what had probably happened: the actor had lost his connection to the theater's server, and been replaced by an NPC actor controlled by the theater's AI. Which implied a fairly serious technical malfunction, these days.

A few minutes later, as the stage was being set for the next scene, several audience members likewise winked out. What the hell? In the

event of a temporary disconnect due to network difficulties, any virtuality's AI would be programmed to smooth over the fault by continuing the gesture already in progress, finishing a sentence, implementing a stammer, or otherwise papering over the fact that a client was link-dead for a few seconds. A handful of seconds was all it typically took to renegotiate a fresh connection that worked around whatever had caused the communications disruption. For an AI just to let avatars vanish into thin air, the disruption had to be serious, and permanent. Clay had only seen the like a few times before, in all the years since he'd begun practically living in virtuality.

"What in the world is wrong with this place?" Salma whispered, leaning towards him.

"Um, I know not milady, but methinks the historic recreation atmosphere be spoilt now." But mayhap there would be a silver lining to that, he thought.

She gave a soft, reproving snort. "M'lord doth not jest. Maybe we'd better hope the whole theater doesn't crash," she muttered and turned back to the stage, which looked almost ready for the next scene to begin.

Clay barely had time to roll his eyes in silent agreement when everything around him dissolved into grey mist, like 3D static. Salma was gone, too. Holy hell! What was this, a power failure? He flicked a thought at his immersion client console, which responded at once, and began performing the diagnostic he requested. Nothing. So that was all right then. It wasn't a problem on his end. Must have been the theater.

He sent a PM to Salma asking where she wanted to meet up. Private messaging in virtuality worked a bit like telepathy, provided you had the other person's coordinates and they accepted your contact. In only a couple of seconds, Salma's voice spoke in his head in response: "Tout le Monde Cafe." Her tone sounded both exasperated and amused.

Seconds later he zoned into the cafe's world, stepping out of a doorway into a street less than a block from the establishment. It was early evening, on a summer day in a Parisian street sometime very early in the twentieth

century. Clay headed directly for the cafe's doors. He walked in, doffing his hat, and sat down at one of their usual tables. A waiter came over at once.

“Good evening, Monsieur Thorsten. Would you like your usual cafe au lait?”

“I would, Robere, thank you,” he replied in perfect, unaccented French. “Mademoiselle Rivera will be joining me shortly.” Right on cue, a carriage clattered to a stop out front.

“I perceive your timing is impeccable as always, Monsieur. In that case, shall I fetch creme brulee as well?”

“Please. Also a serving of those wonderful peach crepes, if you would.”

“Of course, Monsieur,” Robere said as he turned away toward the kitchen.

Salma strode in and joined him, turning heads and getting smiles from the staff as she always did. He rose and grasped one of her white-gloved hands as he conducted her into a seat opposite his with a slight bow. She smoothed her voluminous dress and folded her hands on the lace-covered tablecloth in front of her.

“Rather surprising ending to the play tonight,” she offered, speaking French in deference to the setting.

“Looks like the Globe burned down again. I can't say I thought much of the second act, that's for sure.”

“I don't think you thought much of the whole thing, Monsieur.”

“True, Mademoiselle. I confess I was thinking too much of you.”

She laughed coquettishly. “That's not exactly a news flash. Let's see what is.” She pressed an embroidered design on the tablecloth and the bouquet of violets in the center of the table was replaced by a holoscreen display. This cafe was only a superficial period recreation; it was also a coffee shop where patrons came to read the news of the contemporary world. Salma quickly navigated to a breaking news feed, and entered the name of the theater company as search criteria.

Nothing came up. What did come up though, was entry after entry from meatspace about explosions, sudden fires, and reports of parties of armed men breaking into buildings or emerging from sewers, all of which occurrences were being linked to widespread cyberverses outages. Clay, who could see the exact same display from his side of the table, gaped.

"It wasn't some random accidental equipment failure. They must be deliberately destroying server hardware!"

Salma met his gaze soberly. "It's the only thing that makes sense," she agreed.

"But it makes no sense at all," he protested. "Why blow up random systems? A Shakespeare play, for God's sake? Who'd want to disrupt that?"

"They say it is the Knights of Jesus, Monsieur," said Robere as he arrived to serve them their crepes, dessert, and coffee. "They are, so to speak, on a holy crusade. They do not pick their targets with any care."

"Because they hate all of it equally," Clay finished.

"Just so, Monsieur. Would Mademoiselle like sugar?"

"Please, Robere," she answered.

"Well, do you suppose we're safe here?" Clay wondered aloud.

Robere wiped his hands on his apron and stood up proudly. "Indeed, Monsieur. Here at the Tout le Monde we are hosted on only the most advanced of hardware, the better to facilitate our news feeds and the superbness of our flavors. Our servers are located in a nanosteel capsule anchored on the bottom of the Bay of Biscay, in truth not many miles from the beloved soil of La France. We expect no primitive terrorists *here*," he sniffed.

"Well that's good to know," Clay allowed.

"Very reassuring, thank you Robere," Salma agreed with a smile. He bowed, picked up his tray, slung his white towel over his shoulder, and headed back to the kitchen.

Clay watched some of the audio-visual vignettes of burning buildings and scurrying dark-clad ninja-like troops bristling with weapons, and his face

darkened. "This can't be allowed to stand," he said darkly. "Who the hell do these dudes think they are? What right have they got to go around blowing up other people's worlds? The damn government has got to do something about this. If they're worth anything at all."

Salma gave him a commiserating but calming look. "My dear, what makes you think the government isn't involved in doing this?"

Clay looked surprised. "Wanton public disorder? Random destruction of property, and probably even people? Bit of a change of tune for the law and order pimps, isn't it?"

"Not really. Isn't that an apt description of what war is all about? Governments have fought wars since time immemorial. Besides, who else do you know of who has so many armed men at their disposal in meatspace?"

Clay's eyebrows furrowed in thought, showing she had asked a good question. "Those KOJ fanatics might. And there is no actual army anymore."

"Maybe. And maybe they're getting help from the Federation, which *does* still have security forces. They'd at least have to be looking the other way, for something this widespread to happen. And there's that Homeland Security czar, who's always talking like he wants to yank everybody out of the cyberverspace and back into some militaristic socialist meatspace paradise, like the one people lived in before the cyberverspace got started."

"The government's full of reactionaries with retrograde delusions."

"Exactly. And maybe some of them are actually delusional enough to try turning back the clock. That's all I'm saying."

Clay sighed, took a bite of delicious crepe. "At any rate, I suppose this *is* too big for the Federation dorks to handle, even if they aren't involved on the other side. Folks are going to have to do for themselves."

Salma looked concerned. "Do what?"

Clay gestured at the translucent holo image between them, with its dancing flames. "Protect their property. Their way of life. Do you want a

bunch of nuts torching every theater we go to?"

"Of course not. But quite a lot of the cyberspace systems have got to be out of their reach, like this cafe. There's a lot of computing power in the sea, in orbit, on the moon, and out at L5 these days. What they're hitting is probably mostly older gear in server farms leftover from the days of the internet, when the backbones weren't wireless and hosting hardware was therefore centralized."

"I agree. But that doesn't necessarily mean that they couldn't go on to target newer systems once they got done picking the low-hanging fruit. Getting to orbit is trivial these days, Salma. And even if they can't or won't, it sure as hell doesn't make what they're doing right."

"Of course not. But how would anyone stop them?"

Clay shrugged, sipped coffee. "The same way you'd stop anybody like that. You stop their fucking clocks."

Salma looked at him steadily. "You use violence, in other words."

"Defensive violence. There's a difference, sweetheart. If they do nothing else, nothing happens to them. But if they keep doing what they're doing, they get themselves iced. Up to them. Cause and effect."

"Clay, you saw how many people were involved. How would you stop them? You're not a superhero."

"Don't need to be, baby, I'm a marketing guy."

She laughed. "Yeah, right. I was forgetting."

He looked mock-offended. "You think I'm not serious? How many people do you think are really pissed off right now? Just us? I guarantee you there's one whole helluva lot of people just steaming over their holoscreens right now. The call goes out for a massive posse, you think I couldn't sell that?"

Salma thought about it seriously for a moment. "Actually," she said at last, "I'm pretty sure you could."

Man is born free, and everywhere he is in chains. One who believes himself the master of others is nonetheless a greater slave than they.
-- [Jean-Jacques Rousseau](#) (1712 - 1778)

Chapter 24

Sisyphean Rock of Ages

Reverend Maxwell Cleary tried to look more attentive than he felt. Some of the Order's top logistical men were giving a detailed report assessing the results from Skull Fracture Day, now five days in the past. Cleary had a pad and a pen open on the table before him. He liked to take notes the old-fashioned way, by writing them in longhand. But so far, below today's date he had only jotted down two figures: 571 and 11%. The first was the number of brain house targets which had been hit within the North American Federation. The second was an estimate of the total degree of reduction in cyberspace packet traffic which had been observed. The first number was according to plan; no attacks had failed. The second number was a big disappointment.

Months of work and planning, a massive, interlocking, continent-wide operation involving thousands of commandos, and yet it had netted them just over a ten percent sized dent in virtuality. There was of course some question as to the reliability of the traffic reduction estimate, in view of the tragic loss of the government's mesh monitoring engine, Ferret. Now there was an oversight Sarner's people had committed which beggared his own mistake with the dam. The argument concerning the degree of uncertainty in the figures had raged until Cleary had put a stop to the bickering amongst Christian brothers. Whatever the precise figure ought to be, it was certainly much lower than they had all hoped.

One of the brother Knights, who was a former brain house administrator, was now holding forth at some length concerning his explanation of why this was so. Cleary found his attention wandering, the more technical the man's presentation became. He also found the note of passionate interest,

and pride in knowledge, in the speaking brother's voice rather disturbing. Bad enough that a committed brother should have to fill his head with so much of the Adversary's knowledge, let alone take pride in the knowing of it, as if it were some distinction that set him above his brethren.

Nevertheless, he gathered that most of the computers which hosted the cyberverses ran something called DR.OS, for Distributed Resources Operating System. This system permitted computers to offer processing, data storage, and data transmission and relay for sale at competitive metered rates. It now appeared that the high concentration of computing hardware into centralized brain houses was due mainly to factors of minimizing transmission delays between systems, and economies of scale. In other words, the big brain houses they'd destroyed had burned the brightest on the Ferret map because they were the cheapest paths for data. Not the best or the most sophisticated, merely the least expensive and therefore the most utilized. In fact, on the contrary, most of those sites now appeared to have contained mainly older systems, if anything *less* sophisticated on the average – which explained why their rates had been set lower.

Evidently an awful lot of spare capacity had existed, which the destruction of the older, lower cost systems had brought into immediate use. The bottom line was that Operation Skull Fracture had done relatively little to deprive the denizens of the cyberverses of access to their counterfeit worlds. It had merely raised the price of that access. This, it was feared, would prove to be a temporary effect, obtaining only until the incentive of higher access fees resulted in the deployment of more competing resources. Whereupon prices would fall again, with the end result that newer and better hardware would be available for the same or even less cost than before.

Perhaps even worse, the newer equipment had longer wireless transmission ranges, which allowed for more routing redundancy and necessitated much less centralization. To say nothing of the fact that

housing related servers in geographically disparate locations would, as of now, become standard practice.

Which meant that all they had really managed to accomplish was to cause the worldwide mesh to improve itself, and render itself less vulnerable to attack in future. Reverend Cleary was reminded of the analogy of a forest fire ultimately renewing and improving the health and diversity of the forest. It was ironic in the extreme.

But in the meantime, elevated costs *were* causing a slight reduction in traffic across the mesh. There was also no question that certain unique data stores had been destroyed in the Operation. However, even that now proved to be less widespread than they'd hoped. It seemed that this DR.OS system facilitated redundant storage of important data files by "striping" them across multiple systems: specifically, computers that were sufficiently distant in terms of light-seconds to guarantee a significant geographical distribution of the component stripes. Thus the only data the Operation had managed to destroy utterly was contained in files where one hundred percent of the striped fragments had all been stored in targeted brain houses. Even in these cases the destruction might not have been total, if some fragments had gotten copied to other hosts once earlier copies became permanently inaccessible, triggering an automatic backup. It had not been possible to wipe out all 571 brain houses simultaneously, and that meant that quite a lot of data may have gotten copied out, like rats fleeing a sinking ship, just as soon as the destruction of one copy caused the backup copy to clone itself elsewhere automatically.

It was like fencing with a pool of water, Cleary reflected. How in the world had the Devil's network gotten so clever, and so resilient? Everyone in the Order had felt Called to take up arms in the struggle. And had believed that all that was necessary to achieve the Lord's purpose was to answer that Call. Yet now, today, forcibly contemplating this many-headed, adaptive hydra that was the global mesh, the efforts of Good seemed paltry. Who would have guessed that their main achievement would be a small,

transient reduction in mesh usage brought on by the price elasticity of demand in cyberspace?

To say nothing of the fact that the enemy was now forewarned of their intentions and their willingness to act. As Cleary half-listened to this brother up front nattering on pedantically about the reduced concentration density of self-extending geodesic networks, he couldn't help wondering what kind of reprisals might be getting planned in conference rooms in the cyberverses even now. Would the Devil's creatures strike back? And what should the Order undertake next?

Cleary had already heard yesterday from Roger Sarner on that subject. The Homeland Security Secretary was convinced that only relentless house-to-house search-and-destroy tactics would ensure victory. Sarner was greatly encouraged by the fact that at all the sites they'd destroyed, there had been no resistance other than from a few maintenance and support personnel, taken by surprise and easily overwhelmed. Accidents and friendly fire had accounted for all of their casualties, and remarkably, no one had been killed in any of the raid teams. "Our answer to decentralization must be determined thoroughness," Sarner said in his communique.

But Reverend Cleary wasn't so sure. The 571 buildings they had raided as a rule were not dwellings. It was now clear that in order to disrupt access to the cyberverses, individual "users" were going to need their personal house systems and cyber jacks destroyed. Cleary was pretty sure that such tactics would generate resistance, though just how much was unclear. Already there were some pretty ominous rumors circulating about the formation of vigilante groups. Of course it was unlikely that random rag-tag resisters would be able to do much against trained, veteran troops organized by a central command structure. But what would happen to their popular support if those troops became compelled to gun down citizens defending their homes and property? And what would happen to the solidarity of the movement once loss of life inevitably began to occur?

Still, he had to admit that neither he nor anyone else in the KOJ had any better ideas at this moment. A second round of attacks against an even longer list of targets, each of which was individually less important, wasn't going to get them anywhere, even if it, too, somehow went off without resistance. That much at least, was now clear. Cleary hoped desperately that his son could shed some light on what they should try next, from his position inside the enemy camp. But Daniel wouldn't be back until the end of the week.

In the old days, to save souls you sometimes had to go out door-to-door bearing only a book of Scripture and your faith. So if tomorrow they had to go out amongst the unbelievers' houses bearing only faith and high explosives, at least the parallel was somehow vaguely comforting.

The brother up front seemed to have momentarily run out of steam, so Cleary seized the opportunity to thank him for his report, and called for the next item on the agenda.

*Though all the crannies of the world we filled
with Elves and Goblins, though we dared to build
Gods and their houses out of dark and light,
and sowed the seed of dragons – 'twas our right
(used or misused). That right has not decayed:
we make still by the law in which we're made.*
-- [J.R.R. Tolkien](#), "On Fairy Stories" (1938)

Chapter 25

An Appeal To Reason

A fair number of people had chosen to attend the gathering. Enough, perhaps, to achieve something. Justin looked around the garden again, noticing more new arrivals. Over there was Stefan, visiting with several of his Institute staff, including Temporal Digital Recreation (TDR) beneficiaries Craig Stenson and Arturo Scalleni. Kara Owens was there by the fountain, her red hair making her stand out in the group, which also included Ray, Marina, and several others whom Justin recalled as having been present on the day they'd started all of this by Cronus scanning Craig. Riksana was a little ways away, resplendent in a saffron silk dress, chatting animatedly with their hosts: Petrov and his stunning Indian wife Shanti. Petrov's dark, brooding visage was positively transformed by a sunburst smile as he turned to say something to his wife. Riksana threw back her raven head and laughed at whatever comment he'd made. Justin was glad to see her enjoying herself. She'd been working so hard of late.

The setting was strange to say the least, and had Petrov etched all over it. A green garden lay at the bottom of what looked like a ruined Greek amphitheater, dotted with splashing fountains full of white marble statuary ripped straight out of Michelangelo. Grass sprouted out of the cracked stone of the amphitheater, which was surrounded by low shrubs and olive trees. The sky was a deep lavender, aglow without any obvious source of illumination, like a perpetual twilight. There were no stars or other visible astral bodies, just rocky tors frowning down framing the scene. Nearer at hand, torches on poles amidst the fountains and tables of refreshments

provided a counterbalancing lighting which softened the harsh glamor of the sky and made the colors of faces and clothing appear more natural. The entire effect was that of a rocky outpost hung unsupported in space, like an ancient blister of civilization still clinging to some remote, forgotten asteroid.

Down in the very center, where the amphitheater's stage would have been, was a large round table of rough wood, ringed with chairs. Every time he glanced at it, Justin got the impression it was larger than before. Abruptly he realized that the number of places was expanding to equal the number of guests present. He couldn't help smiling at the subtle touch there.

After a few more minutes of mingling and greetings, during which nobody else arrived, Petrov raised his arms and softly asked people to take their seats. The buzz of conversations petered out as the guests began moving toward the conference table. Riksana's path intersected Justin's and she took his hand as they strolled over to take adjoining seats. The mood seemed almost convivial, as if recent events were little more than a good excuse for old friends to get together.

When all were seated and the greetings and handshakes had died away, Petrov got to his feet. He stood silently for a few moments, eyes sweeping the gathered Full Sings, as if organizing his thoughts, or perhaps trying to gain a feel for theirs. Justin found himself doing likewise.

There were forty-one people present. They represented practically every race, color, and ethnicity of the biological human species across six continents, as well as a number of hybrid permutations, such as Petrov's own mixed Ethiopian and Slavic ancestry. Being personally acquainted with most of them for some years, Justin knew that they also represented an equally varied mix of specialized knowledge and professions: physicists, artists, architects, business entrepreneurs, mathematicians, musicians, engineers, writers, economists, cyberneticists, philosophers, biologists, historians, and more. And all of them functioned at an ability level orders

of magnitude beyond that of biological humans. If any gathering of beings should have the capability of piloting a course through these difficult times, surely this one would – provided that they worked together harmoniously, of course.

Suddenly Justin realized that, without uttering a word, this fact was exactly what Petrov had wanted to communicate. The looks exchanged around the circle showed that the rest of the assembly got the point as well, and a touch more solemnity enveloped the gathering. Having made his opening statement nonverbally, Petrov now spoke softly in his light baritone, which always sounded rather incongruous emanating from his massive frame.

“Thank you all for coming. Since it now seems to have become customary to reassure guests as to the safety of their virtual hosting, let me assure you that we are running here on some of the newest and finest hardware to be found anywhere in lunar orbit.” This was received with some light laughter. “Before we move on to a discussion of how we can best avoid ending up here on a permanent basis, I'd like to ask for several of our number to provide some reports – succinct ones – concerning their work on various projects extending a number of frontiers. First, the man of the hour as it were, the fellow whose project proved to be the tipping point which ignited the Mosh retro-revolution: I give you Dr. Stefan Jager, Chairman of the Archimedes Institute of Temporal Physics, and first chair trumpet on the Last Trumpet Project.”

Petrov grinned as he sat down, while Stefan got to his feet, amid a growing swell of applause. Stefan *looked* like a stereotypical research scientist: balding, bearded, a bit pear-shaped, though of course he wore no glasses and was as well dressed and groomed as anyone. He genuinely looked a bit embarrassed at the outpouring of support, which only caused it to turn into a standing ovation, as everyone rose to make the point that the reactions of a bunch of irate, irrational Moshes didn't detract in the least from what was, in fact, quite a remarkable achievement. Stefan stood there

looking uncomfortable but relieved, and finally had to laugh and take a bow, and then wave his arms for silence.

“Thank you, friends, for your support,” he said once everyone was again seated. “That means a lot to me, and to all of us on the Cronus Project. Well, what can I tell you? Petrov requested a brief report, so I'll endeavor to oblige. The Project has now carried out, as of today, 11,897 successful TDRs, or Temporal Digital Recreations. These represent but a tiny fraction of the more than seven hundred *million* TDR requests which the Institute has so far received. We have, naturally, been laboring hard to increase our processing capacity by means of parallelization. Over the short term, efforts to mass-replicate our equipment have reduced our TDR completion rate, but we expect to be able to ramp up to about ten thousand TDRs per day by the end of the month. The effective reach of the Cronus device back in time has been extended to somewhat more than one hundred years, to the first decade of the twentieth century. It is expected that this will soon extend a great deal further, as we complete redesigns of some of the focusing hardware. That development will, of course, only serve to boost the anticipated number of TDR requests.

“As far as impacts from the events of six days ago, our systems have not been affected, apart from the loss of some older routing hardware, which has already been replaced. Our business planners have successfully developed cost estimates and fee schedules for an entire matrix of TDR requests and subject hosting arrangements, based on our system redesign and replication progress. We've signed contracts with Petrovmesh, Virtutech, and several other virtuality hosting companies to provide subject housing. We have almost two billion yottacalcs of processing power on order from various vendors to meet our expected future growth curve. If that sounds like a lot, it is. The only thing that's saving us from bankruptcy is the fact that it can't possibly all get delivered at once, especially given the, uh, replacement demand that was created last week.

“So, I'd like briefly to announce that the Institute has spun off a separate

business unit, Paradise Systems, a cyberverspace company limited by shares. This entity will be marketing the Project's TDR services, under exclusive license from the Institute. To raise the needed capital, shares of the new company will be offered, starting tomorrow, through private placement with purchase via Aurumnet. Please contact my Paia with any inquiries concerning particulars.

"I guess that about does it. We are also hiring certain specialists, if any of you happen to be looking for work." Stefan smiled, knowing that wasn't too likely in this company. He took his seat, to a round of appreciative murmurs.

Petrov stood up again. "Professor Sky, would you like to update us on the Alpha-C Project?"

A tall, lithe Amerind woman nodded and got smoothly to her feet. The very appropriately named Starry Sky headed a private foundation's team working on launching an exploration mission to the Alpha Centauri system. "In view of the current circumstances, we've decided to press ahead with the launch of the prototype vehicle as early as the middle of next month," she said evenly. Murmurs of surprise greeted this announcement. "The technical problems of the photonic drive have all been resolved, and our remaining hurdle is the patterning program. However, we believe that we can make remote adjustments in transit to complete the configuration once the protocol is finalized. Accordingly, there is no real reason to delay the prototype's departure."

Justin knew that such certainty could only have come from one source, and resisted looking at Riksana next to him. Petrov, however, did look at her, and called on her next as Professor Sky sat down.

"Riksana Namoto's team is working on a breakthrough in matter patterning, which will be useful to us all. Would you like to give us an update, Riksana?"

Riksana sighed and stood up. "Certainly. There are still some areas of feedback instability to be worked out. But the basic protocol is nearly

complete. I can't offer you an exact date, but full operability is at most three or four months away." This caused a curtain of aghast silence to fall like a blanket over the table.

"Are you certain, Riksana?" Stefan inquired.

"Eighty-three point six percent certain, yes," she replied with a smile. There being no further questions, she sat down again.

Petrov rose and again swept the assembly with his gaze. "I asked these three individuals to give us these status reports to illustrate that we stand on the threshold of great things indeed. The Singularity, after all, is not an end in itself. But we also stand on the edge of some peril, and to address that topic I'd like to call on Justin Turrell to give us his take on the current situation with the Moshes."

Justin got to his feet, nodded at Petrov, and smiled at his assembled peers. "Well, you don't need me to tell you that something in this Last Trumpet business has struck a chord – a very dissonant one – with the Mosh religious and political communities. Which makes it ironically fitting that we've been able to use the Cronus Scanner to piece together the activities and motivations of the other side. The responsible culprits are – again, not exactly news – the so-called Order of the Knights of Jesus, and a radical reactionary faction within the government of the North American Federation. These groups are headed up by Reverend Maxwell Cleary and Secretary of Homeland Security Roger Sarner, respectively.

"Cleary's group of fanatics has provided both intel and logistical support, and even contributed a significant fraction of the commandos who actually carried out the 3/3 raids. Sarner and his people have, effectively, executed a coup. It appears that the legitimately elected officials are now in "protective custody," and are likely to remain there. Government explanations for the events of 3/3 tell only a portion of the truth, as is their wont. They point the finger at religious extremist terrorists, but without naming the KOJ explicitly, and without admitting their own collusion.

"As near as we can determine, larger node clusters were targeted based

primarily on average transmission bandwidth, as far back as six months ago. In each case an access point was prepared secretly, usually via a tunnel dug under streets to reach building foundations. On 3/3, commando teams blasted their way into the target buildings, and destroyed the equipment there using plastic or chemical explosives. The surreptitious access routes served to conceal the demolition activities from public view until the deeds were already done. Emergency response teams were rapidly pulled in too many directions to be at all effective. There was, unfortunately, some resulting loss of life.

“The targets were selected using mesh traffic monitoring performed by the Ferret system, a somewhat archaic packet analysis program fed by radio spectrum monitors distributed across the continent, linked to a central hub in China Lake, California. A descendant of the Echelon system, first deployed by the former United States empire some eighty years ago to engage in global espionage, Ferret, in its latest incarnation, was a bit more than six years old. This means that it was generally incapable of monitoring those parts of the mesh which utilize network frequencies and protocols that came into common use since its construction. Moreover, the poor density of its monitoring stations in geostationary orbit resulted in an almost complete inability to detect node clusters in earth orbit, lunar orbit, on the Moon, or out at Lagrange points. For that matter, no oceanic hubs were targeted, not even those close-in on the continental shelf. I say *was*, because the government's operation inadvertently destroyed their own China Lake central facility.”

Justin paused for the expected outburst of laughter. “The net result of the 3/3 brain house attacks, which were dubbed “Operation Skull Fracture” by Sarner – evincing his customary brutish glee – has been a seven percent increase in average cyberverspace access costs. This rise in price has induced a demand side traffic reduction in excess of nine percent. During the event there were, in fact, numerous service disruptions. There has also been substantial resulting data loss.

“However, overall damage to the infrastructure of virtuality as a whole was minor, owing to several factors. First, the fact that Ferret's deficiencies resulted in targeting primarily older, lower cost, and lower technology facilities located only on North American soil. Second, the existence of spare capacity which was able to fill most of the service gaps using newer equipment, albeit at higher costs. Third, the redundant and parallel nature of the distributed mesh itself, coupled with the practical limitation on the number of targets which could be destroyed simultaneously.

“What damage there was, including the price hikes, should be fully mitigated by the end of the month. Alternative and replacement capacity continues to be deployed. At my suggestion, the Archimedes Institute has generously agreed to allocate some Cronus bandwidth to the task of recovering the quantscans of each of the 571 destroyed facilities as they existed immediately prior to their immolation. This will allow recovery of any lost data, which will then be returned to its owners.”

There was some appreciative applause at this news, which Stefan acknowledged with a nod. A fair number of virtual worlds had been completely destroyed, including their backup copies, which to this crowd represented a cultural crime almost comparable to the burning of the Alexandrian Library by the Romans. To destroy an entire world, with all its complexity and its history and its place in the lives and memories of the people who'd created it, who visited and enjoyed it, and who valued it, was a crime indeed; and one not lessened by the fact that that world might be lower tech, or fallen into desuetude, and thus relegated to older hosting hardware. The senseless and irrevocable destruction of created culture was an event to be mourned and deplored.

“The Moshes have caused a great deal less damage than they intended,” Justin went on. “This is because they fail to understand self-extending, decentralized networks, or technological evolution generally speaking, or the operation of free markets. Government types have seldom understood

these things well, and have usually feared them to the extent that they did understand them. Religious types often disdain such things as being too “worldly,” and therefore do not trouble to investigate them thoroughly. As a result, these clueless conspirators managed to convince themselves that they were about to deliver a crushing blow to a more advanced civilization which they do not even clearly comprehend. They were, quite naturally, mistaken.

“Nevertheless I want to caution us all against feeling smug or complacent. Even Moshes can learn from their mistakes, and the evidence suggests that they are now contemplating actions which may prove even more bothersome over the long term. For example, house-to-house and building-to-building sweeps searching out and destroying all computer or network related equipment. The use of military aircraft, ocean craft, and spacecraft to attack orbital and ocean-based computing platforms. Orbit ladders around the world make geosynchronous orbit as easy to reach for them as for anyone else. Although contemporary molecular, atomic, and quantum computing hardware is essentially immune to the effects of electromagnetic pulses, a substantial number of nuclear explosive devices, aka hydrogen bombs, are still known to exist in the hands of various governments. They do have the theoretical capability to project such payloads even as far as the lunar surface.

“Moreover, the indications are that a corollary wave of Mosh religious and reactionary political fervor is sweeping the globe, and is in no way confined to the North American territories. Sympathy and copycat attacks on 3/3 were very limited, but a rising tide of worldwide anti-virtuality violence has already commenced. We are dealing, here, with two primary mindsets: that of political authority, which is tired of being marginalized; and that of religious belief, which is offended by what it sees as the heretical worship of false gods. Although church and state in recent centuries have frequently found themselves at odds, they now find themselves traveling unwillingly in the same decrepit boat: sailing to Here-

There-Be-Dragons, off the edge of their flat earth, into the endless sea of oblivion.

“Indeed it is the motivations of our Mosh opponents, rather than their actual deeds to date, which trouble me most. In religious extremists like the KOJ, we encounter people who genuinely believe that the end times are upon us, and who are therefore willing, or perhaps even desire, to perish for their faith. In pro-government extremists, we encounter those who still cling to the twisted belief that the exercise of authority can improve the world: a fallacious paradigm which resulted in the violent deaths of some quarter of a billion human beings in the previous century alone, and the needless impoverishment and suffering of billions more. These people, from both camps, stand ready and willing to utilize asymmetric tactics which do not gain their ends, and could even result in their own destruction. They simply do not care; they are prisoners of their own instinctive biological imperatives. The drive for authority, for power, for wealth, is ascribable to the lust for security and expanded mating opportunities. The drive for religious justification and redemption is ascribable to guilt, self abnegation and contempt. These are powerful, primal memes, which do not commonly conduce rational behavior.

“Which brings me to where I feel the danger truly lies. It is not to us, who exist fully on higher substrates. I have no doubt that we can stay ahead of the fanatics, and outwit them as required. By the time they figure out where we might be vulnerable today, we could well be established three star systems away. The danger, ladies and gentlemen, is to those of our race who are not yet fully virtualized. The vast majority who still have biological bodies, who require immersion chambers and mesh jacks to access virtuality, and whose bodies and dwellings and personal computing hardware are soon to be at risk.

“There is of course no reason to suppose that the biological Sings will not resist and defend themselves. Which means that the main risk we face is the usual one: civil war. From our Singularian perspective, all wars are civil

wars, because they are all internecine within the human tribe. This one could easily prove to be as bloody and destructive as those of the past.

“My friends, I believe that it is our responsibility, as the highest intelligence that we know of, to do what we can to mitigate this violence and strife. The Moshes fear our potential ability to destroy them; and indeed, it would be simple to do so. But on the contrary, I believe that we must preserve them. And yet prevent them, to the extent that we are able, from harming those others who are vulnerable to their irrational aggression. If you agree with me in this, then I would like to ask each of you to give this matter some thought. It is not retribution that we must seek, but mercy and peaceful coexistence, for all our brothers and sisters of the human tribe.”

There was no applause, but a thoughtful silence.

“I would like to point out, Justin,” Kara offered, “that our beloved cyberverses took so little damage from this would-be holocaust largely because you wrought so well back when you developed the DR.OS Protocols.”

“Hear, hear,” agreed several others, and there was another brief round of applause. Justin caught Riksana beaming up at him as she applauded.

“Thank you, all,” Justin acknowledged. “Unfortunately the civil disturbances in meatspace are beginning already.”

“Is there any organized resistance yet?” asked Starry Sky.

“No. But I expect that it will organize spontaneously, soon.”

“It's a pity we can't induce the Moshes to carry the fight into the cyberverses themselves, onto our turf,” Shanti commented.

Justin concurred. “That would be desirable, in that they could find here whatever kind of world they wanted, without impinging on other people. But I fear that many of the Moshes, particularly the religious ones, would never agree even to consider this, regardless of the circumstances.”

“What kind of military technology is available to the biological Sings?” Art Scalleni wanted to know.

“Potentially, all kinds. Molecular manufacturing can construct weapons as easily as anything else, and the digital blueprints are readily available. I suspect the government troops may be in for some surprises.”

“It sounds to me like the formal part of our council is now concluded,” Petrov offered. “We all know where we stand and what must be done. I would suggest that further discussions need not involve all forty-one of us together. I recommend we practice a little spontaneous order here among ourselves, so without objection, let's break this up, mingle, and continue the gathering as you please.”

No one objected, so everyone rose and resumed talking and visiting in smaller groups. Justin began making the rounds again, this time at Riksana's side. Something in the way Petrov had abruptly broken off the formal conference suggested to him that his friend had had an idea. But judging from the minimal head shake that Petrov gave him when he saw Justin looking at him, he was not yet ready to discuss it.

The trouble with ignorance is that it picks up confidence as it goes along.
-- Arnold H. Glasgow (American psychologist)

Chapter 26

A Beautiful Day in the Neighborhood

A man fell, screaming, off the corner of a high rooftop. The scream cut off abruptly as his rifle caromed out of his hand at its impact against the sidewalk, and clattered back to earth, less broken than its owner. The results were not pretty.

Roger Sarner emerged from where he'd been crouching behind a ground car. He shook his head. That dead bastard there had been sniping at their dynamic entry team as they moved to enter the building. The sniper's opening salvo had missed hitting anyone. Sarner's men, quickly returning fire, had not. Still, that had been disturbingly close. He'd wondered how long it would be before this sort of shit started happening. Damned vigilantes trying to protect what they considered their property.

They had no real chance, of course, not here in meatspace where the laws of physical reality applied all too strongly. Like gravity, he mused, watching his men check out the fallen sniper. The medic gestured negatively. No need to expend any more bullets here. Another trooper picked up the damaged rifle and handed it to the boss, as he walked over and extended his hand for it. The trigger guard was mangled and the rear sight broken off. Still, it was salvageable. Sarner checked the mag, was chagrined to notice armor-piercing rounds. This was a fine weapon, not the sort of thing you wanted people outside the government to have. And this was why. Had that man had more practice shooting moving targets at a steep angle in a crosswind, let alone smart ammo, he could have killed somebody.

Naturally, the digital particle blueprints which would allow ordinary MM units to manufacture working copies of guns and ammo such as this were completely illegal. Possession carried a ten year prison sentence. But that

sure as hell didn't stop anybody who would actually be willing to use such a weapon. He had to admit that there was just no controlling the spread of undesirable information. Fortunately, while Sings could download new skills in their cyberspace worlds, or so he understood, it didn't work as well for them when they were employing those skills using their real meatspace bodies. There was this little matter of training the neural pathways through repetitive practice, which didn't come automatically just because someone knew how to fight or shoot in theory.

Despite the fact that this rebel dumbshit had failed and gotten himself dead for his trouble, the very fact that he was able and willing to attempt such a thing disturbed Sarner. The saving grace was that lone kook like this guy didn't have any real organization. If a gang of them really got together it could spell trouble, though that wasn't likely. This was one sense in which the massive fragmentation of society that virtuality had wrought had a real bright silver lining.

"There may be more of them," he said as he handed the weapon back to the squad leader. "Keep an eye out while the other teams are inside."

"Yes, sir." Three more squads, forty-five troopers, now entered the office building. Sarner checked his wrist chronometer. Nearly noon. They'd been sweeping through downtown LA, hitting some likely looking brain house locations, before fanning out into the southern residential areas for some more house-to-house sweeps. In another hour they were due to rendezvous with around a hundred more men and start moving street-by-street through Torrance.

It was slow work. Painstaking. Each house had to be penetrated and searched. All computers, transmitters, routers, cyberjacks, immersion chambers, and MM units on the premises were seized or destroyed. Destroyed, unless they merited special interest. Any people found on the scene were searched and identified, but not harmed or taken into custody. Unless they resisted of course, in which case they were shot. Sarner just didn't have enough holding cells for everybody he might want to detain.

Which pretty much compelled him either to let people slide, or deal with them in a forthright and final way up front.

He'd always found willingness to resist to be a good litmus test for deciding which way to go with most people. Almost everybody was steamed at having their homes or businesses raided, but most of them were also scared enough not to let it show too much. Those types he always let go after routine questioning. Even most of the ones who dared raise spoken objections did so on the basis of some quibble about rights or legalities. These, too, he generally let slide. Anybody who wanted to base a complaint within the framework of the system was all right with him, since people like himself controlled that system anyway.

It was the ones who didn't care about who was invading their homes, who didn't give a rat's ass that they were the government, those were the ones who were dangerous. Yet for the most part, those folks held their peace too, at least while guns that could be pointed at them were plentiful. But sometimes you could see it in their eyes: the hate, the rage. Sarner always taught his people to offer extra provocation to that sort. Because sometimes they took the bait and did something overt. Which then provided a golden opportunity to cull the herd.

Despite all the training that Homeland Security provided to its personnel, sometimes his squad leaders got their decisions wrong. Or worse, refused to make their own decisions without consulting superiors. Just not comfortable taking responsibility. Sarner understood that, damnably inconvenient though it was. He used to be that way himself, a bit. But as he'd gotten more experienced, giving life and death orders no longer troubled him the way it used to. In fact, now that the gloves were off so to speak, he found that his sense of duty let him do whatever was necessary.

Looking again at the heap of broken flesh on the sidewalk that had been a man, Roger reflected that he no longer felt incomplete, or starved for something more when he came back from a mission. He realized now that it had been his fears about appearances that had held him back from doing

all that was necessary. His apprehension about being held to someone else's standards of conduct, some spineless nitwit politico's for example. But now he was truly in charge, and thus no longer suffered from that debilitating weakness.

He supposed that theoretically, as the man effectively in charge of the entire North American Federation, he ought to be spending more of his time on big picture stuff, rather than leading anti-cyberverse raids in person. And to be sure, there were certain dangers involved in doing so. But he figured that if he put in the street time today, his squad leaders would learn from his example and be better able to carry on and do their jobs right when he wasn't on the scene. So that when he had to go back and ride herd on the larger effort, things wouldn't stall out or take any wrong turns.

The big picture was actually pretty exciting. It turned out that there was plenty of military hardware leftover from twenty or thirty years ago. Stuff like bombers and tanks and ships that had been mothballed in dry docks. Once national borders became shockingly indefensible, that kind of hardware fell out of use, but some of it was still around and in a serviceable condition. He and Reverend Cleary were recruiting all the people they could get to put it back into service. Soon they'd be bombing, torpedoing, and depth-charging offshore brain house targets, both on the ocean's surface and on its floor. He had people dusting off old surface-to-air missile systems and learning to configure them to go after airborne or even low-orbit targets.

Sarner scanned the clear blue sky with his field binocs. Yes, there. High over LA were a large number of spherical dots. They were comm buoys, completely evacuated spheres made of light nanomaterials so that they floated at a certain height far above the ground. They carried booster transmitters which helped cyberverse networks relay signals, bouncing them off the buoys to extend line of sight around the curve of the earth. Powered by integrated nanosolar panels that ran their transmitters and station-keeping engines, the buoys were routers in the sky that could reflect

or retransmit electromagnetic signals of all kinds, from lasers to microwaves to radio. Funny he'd never thought about it before, but there they were, hovering above most cities. Right now he had pilots training on taking them out with air-to-air missiles.

The orbital stuff the Sings had would be harder to take out, but there were teams working on that, too. Orbital ladders, nanosteel filaments anchoring an orbital platform to the ground with elevator cars traversing up and down the cables, provided ready access to low Earth orbit at thousands of points around the equator. The problem was how to take out satellites once you had your crews and weapons systems up in orbit. And you had to take out the right satellites. Human beings had been putting stuff into orbit for so long now that it was a helluva target-rich environment up there. Of course, a lot of it was derelict technology that nobody had ever cleaned up. Separating the wheat from the chaff, or who the wheat belonged to, was a hard job.

He saw now that their reliance on Ferret had blinded them even while it appeared to be helping them. You just couldn't go after a decentralized enemy by looking for centralized targets. There weren't any. Only a gradual, irresistible purge had any hope of working in the end. Just like they were doing now. In retrospect the destruction of Ferret had been a blessing because it had forced them to rework their strategy.

Of course, that still hadn't saved the doofus who'd failed to take Ferret Central off the Skull Fracture target list. That individual, a mid-level bureaucrat in data processing, had gone to the wall two weeks ago. Sarner still remembered with amusement her tearful pleas to the firing squad. Yeah, right, like the guys weren't gonna shoot 'cause she was a woman or something.

One of the teams was coming back out of the office tower now. From the patches embroidered on the collars of their uniforms, he could see that this squad was KOJ. A yellow eye, styled like the one that used to be on the old US dollar bill, except lacking the pyramid, adorned the left side of their

collars. On the right side was an open book. The Bible symbolism wasn't hard to figure out, but he'd had to ask Cleary what the eye was all about. The Reverend said it was a reminder that the eye of God was always watching over their actions. Fair enough.

He was getting along better with the Reverend these days, not because of the officious little twit himself so much as because he liked working with the KOJ men themselves. They were dedicated, disciplined, and glad to follow orders. He'd experienced no trouble integrating them with his own Homeland Security forces. Sarner had begun to grasp just how useful a religious motivation could be for men with a tough job to do. He found their beliefs interesting. Now if he could just figure out an angle to make them feel more personal loyalty to him, things would be perfect.

"Nothing but a few old office automation computers that haven't been turned on in a long time, sir," the squad leader reported. Damn. Could someone be moving stuff out ahead of them? This complex had looked like such a promising target. Sarner nodded, pointed across the street at a derelict storefront.

"That building looks closed up pretty tight. Why don't you go have a quick look while we wait for the squads upstairs?"

"Right, sir." The KOJ sergeant barked orders to his men, who fanned out across the street, ready to support the entry team as they planted explosive charges on the front door. After the satisfying bang, the men filed inside, weapons out, moving in pairs to cover one another.

Sarner checked his watch again. He really should be back at headquarters masterminding the planning. But they might need him down in Torrance in a bit. More resisters might be found down there. Some people still had this quaint idea about defending their homes like castles. In which case his team leaders were going to need him to set a good example on how to deal with resistance. No, in view of the incident here with the would-be rooftop sniper, he couldn't very well bug out early.

The men all came back out of both buildings, empty-handed. Oh well.

Time to move on to fields filled with richer game. “Let's move out for Torrance!” he hollered, holstered his binocs, and headed for his ground car.

Find out just what any people will quietly submit to and you have found out the exact measure of injustice and wrong which will be imposed upon them, and these will continue till they are resisted with either words or blows, or with both. The limits of tyrants are prescribed by the endurance of those whom they oppress.

-- [Frederick Douglass](#) (1857)

Chapter 27

Piece de Resistance

A masked woman in a white bodysuit fell twisting through the air, continuing the motion of her leap off the high balcony. Even as she plummeted toward the street, she brought her weapons to bear on three targets: darkly uniformed men with KOJ collar patches, carrying their own automatic firearms. The men reacted a hair too slowly to glimpsing her in their peripheral vision, with the result that by the time their guns began to swivel in their hands, a fusillade of supersonic projectiles was already streaming toward two of them. The chests of those two men imploded, and their bodies settled akimbo on the asphalt like dropped puppets, even as the woman landed ten yards away.

Gracefully but improbably taking the impact shock from the five-story dive in her knees, she bounced up off the pavement in a dancer's leap that carried her toward the remaining man, rotating in midair to present a more difficult target while holstering her sidearms. The third man discharged his weapon frantically in her direction, but aimed too high as she fell short and landed in a crouch right in front of him. Even as he corrected his aim and fired again, she deflected his gun barrel aside with one hand, drew a long knife with the other, and punched it through his throat.

With a gurgle, the last KOJ goon collapsed to the ground, even as his killer relieved him of his weapon, spun it around, and gratuitously turned his head into soup with a point-blank burst. Casually discarding the machine-gun, the woman retrieved her dagger, wiped it clean on the dead man's uniform, and re-holstered it at her waist. Then she reached up and pulled off her white head mask, revealing long black hair tied back and a face to stun a man. She faced back the way she had come, expectantly.

A male form, similarly clad like a ninja in white, dropped off the same balcony and landed nearby, rolling, and came smoothly to his feet in the twilight city street. He walked over and likewise doffed his concealing headgear, revealing dark, curly hair and sparkling green eyes.

“Damn, girl,” he expostulated.

Salma Rivera laughed. “You said, go get them.”

Clay grinned and cuffed her playfully on the shoulder. “I did. Just don't get that flashy when we do this for real in meatspace.”

“Oh, I won't,” she assured him. “But the point of practicing is to accustom our neocortexes to the capabilities we'll have with the full-spectrum nanite implants. You're sure this is an accurate simulation?”

“Very accurate. It came from the implant manufacturer. And it's governing our movements based entirely on our own unique neocortex activity. No smoothings or approximations local to the virtual environment. So the capabilities we have now are very close to what we'll have in meatspace. I'm having everybody do a few days' worth of training in here.”

Salma nodded. “It's actually fun. I enjoy it.”

“Killing people?” he asked incredulously.

“No, silly. I mean taking sixty foot leaps and having the hand-eye coordination to shoot accurately while falling. But I'll do the killing too, when I have to.” She waved dismissively at the dead bodies.

“I'd say these assholes are gonna know they were in a fight,” Clay agreed grimly.

Salma stepped close to him and put an arm around his waist. “It's wonderful what you've put together, darling. I'm proud of you.”

Clay snorted softly and gave her a lingering kiss. “I told you I was a marketing guy,” he said with a smirk.

She had to laugh. “So you did.”

Still, it amazed Clay some too, what had gone down in the past three weeks. The IADC, officially the Irregular Army for Defense of the Cyberverses – known more widely and colloquially as the Cyberantes – now

numbered more than twenty thousand top-drawer commandos, with thirty times that many support, auxiliaries, and financial supporters. It had recently subsumed four smaller mesh tribes with similar charters. Clay had written the Charter for the IADC tribe himself, with some invaluable help from Salma, deliberately couching it in the antique language of Jefferson and Paine. A long train of abuses and usurpations, pledging their lives, fortunes, and sacred honor, and so forth. It certainly fit well enough.

Yet once he had entered it into the tribal search engines, which let people locate others with shared interests, the response he got surprised even him. Although only a small percentage volunteered to undertake the radical upgrades to their meatspace bodies and extensive training necessary to become commandos, many more offered to provide technology, resources, money, intel, communications, coordination, medical expertise, and support of all kinds. It was a fortunate combination. The tribe needed the very best in biotech upgrades for human bodies, for weapons and body armor, MM factories and supply distribution networks, combat training programs like this simulation, seamless communications infrastructure, a fleet of transports, spy satellite intelligence gathering, and more. They had gotten all of it, and then some. The Cyberantes tribe had so much gold available right now that three days ago Clay had put out a bulletin asking members to defer contributions until further notice.

Some of the technology had been improved, and in some cases designed from scratch, just during these past weeks. The breakthrough moment had come when Stefan Jager, for whom Clay had started working, abruptly reassigned Clay's duties to include building up the Cyberantes. He'd said that someone needed to do it, so Paradise Systems might as well pay him to do it full time, since he was already doing such a great job. That endorsement had brought some of Stefan's colleagues into the tribe. And some of them were engineers like Clay had never even imagined.

This body armor that he and Salma were wearing had been designed and perfected in just ten days. It looked and felt like rough, stretchy fabric, and

was just as light. Yet it would turn anything much smaller than an anti-tank round, if fired from more than a few dozen yards or at any more than a slight incident angle. Ordinary bullets were iffy even at point blank range. Yesterday, Clay had allowed a percussion grenade to explode cupped in his gloved hands. His hands were forced wildly apart, but a faint sting was all the impact that he felt.

Today the elite commandos were practicing search-and-destroy tactics, by pairs in urban environments. This simulation he and Salma were in was a randomly selected instance of one of several hundred available. The virtual interface had been reconfigured to simulate the precise characteristics they'd experience in meatspace using their real bodies, calibrating sensory input, reaction times, movement capabilities, muscle and skeleton strength, weapons, equipment, and probable enemy configurations and tactics, based upon their latest intelligence reports.

An indicator began flashing a warning red in the edge of Clay's field of vision, superimposed over what he was seeing. As he focused on the heads-up display it became clearer: infrared radar contact, incoming heat signatures that could only be human bodies. He nodded to Salma. She'd seen it too. They put their ski-mask-like headgear back on, drew their automatic weapons, and spread out to opposite sides of the street, facing the oncoming signals.

A squad of six more men came jogging down the street. Unlike the first three, these men were wearing dark body armor, which had a sculptured ceramic look to it, making them resemble superheroes or villains of yore rather than sleek ninjas. Not as good as what Salma and Clay were wearing, but still good enough to shed most of their ordinance, unless fired dead on at close range. Clay tripped his stealth mode, telling Salma to do likewise with the flick of a thought over their open messaging connection. Instantly his bodysuit began reflecting light to match what was behind him. So long as he faced the hostiles, they would see nothing but a faint ripple against the storefront windows behind him, and that much only if he moved

suddenly.

The men started to go past, then checked and turned sideways, four of them turning toward Clay and two toward Salma, glancing down at their rifles. Obviously they had heat sensor targeting devices. In that case standing still was not the best idea, Clay decided. He leaped straight up and toward them over their heads, taking a trajectory with a much higher vertical component than was really necessary, hopefully one much higher than the enemy would anticipate. All four goons facing his way discharged their weapons at the blur of motion he left behind in the window, tracking upward. The window shattered, as did the one where Salma had been standing, as she imitated his motion.

Her word hissed in his head over their message link as he hurtled through the air: "Swords." He silently agreed, and was already drawing his as he came down almost directly on top of the four men facing his way, but a little to one side of them, as his stealth switched off. His first overhand blow, borrowing some of the force of his landing, sliced through the rifles of his two nearest opponents. As they turned toward him, he stepped further to the side to put them between himself and the other two men whose guns were still intact. Then he pirouetted and skewered the closest man through the eye guard. Clay's nanosteel rapier pierced the weaker transparent plate and jerked the man's head back as the visor was opaqued from within by a dark red splash.

Clay saw Salma's blade pass exactly through the gap between armor sections on the arm of one of the men facing her. She trimmed his fingernails to the elbow, and he let go his weapon with a bellow of pain. Clay pushed the man he'd just killed backward into his fellows, simultaneously retrieving his sword point.

Whether by accident or out of panic, the fourth man at the back of the column facing Clay opened fire, straight into his nearest buddy's back. Clay dove forward and to the side, and cut at the knee joint of the next man, who was spinning to get out of the way of the falling dead weight of one comrade

and the friendly fire of the other. The impact drew blood and staggered the man, but Clay's stroke angle hadn't been as perfect as Salma's and the slash did not harvest a limb. The fellow who'd been shot full of lead in the back screamed explosively as he dropped his weapon and then crumpled.

A vicious uppercut slash from Salma bereft her second opponent of his rifle, whereupon she reversed her sword, leaned in, and slammed him in the face with the pommel. He rocked backwards and stumbled.

Releasing his sword, Clay leaped up and grappled with the desperate shooter for possession of his gun, even as he was swiveling it Clay's way, still firing. The shots flew over Clay's shoulder, pummeling the stone facade of the building behind him till it almost disappeared in a cloud of rock chips and shrapnel. With a spasm of superior strength, Clay was finally able to wrench the weapon away.

As he did so, he saw Salma deliver an elegant two-handed swipe to the neck of her staggered opponent as he struggled groggily up off his knees. This time her trajectory was not quite perfect, and the blade hung up on his armor above his collarbone, and rang as it stopped – but on the far side of his neck. As she wrenched it back out, his head flopped bonelessly to that side, revealing shattered white vertebrae quickly painted over with fountaining gore.

Clay tripped his now disarmed opponent and treated him to about fifty rounds from his own gun fired right into his face plate as he lay on the ground. That left only the man with one arm, and the one with a lamed leg. The former now had a pistol aimed at Salma. As she turned toward him, she threw her saber and drew both automatics. He got off several wild shots before the flying sword arrived at his hand and knocked his aim aside. Walking calmly toward him, she opened up with both weapons in parallel. At about eight feet away the bullets suddenly started to penetrate his armor and he did a mad spastic dance, then dropped.

The final trooper was crawling on his side, unable to walk. He had started to crawl away instinctively, then realized he should be crawling

toward a weapon. He'd almost reached the one dropped by the man who'd been riddled in the back, but froze when he saw Clay's attention transfer to him. Clay shook his head minimally, dropped the gun he was holding, and drew his own. He walked over to the last of the six, and gestured for him to remove his helmet and face guard. The man complied, revealing a sweating face drawn in a rictus of pain as he clutched his damaged knee.

"Prisoner," Clay stated, as Salma walked over to stand next to them. The trooper nodded, did not resist as Salma relieved him of his sidearm and belt knife. "In fact," Clay went on, "that's enough for the time being. Freeze simulation."

Everything around them froze into still life, though Clay and Salma could still move. For a moment they surveyed the tableau they had wrought together, and exchanged a long glance. It was a sobering thought to be a killing machine, to realize that they could now commit violence like this in real space. And even more sobering to realize that they might have to. They were not proud of it; but still, it represented a rite of passage of sorts.

By silent agreement, they zoned out.

Of all tyrannies, a tyranny sincerely exercised for the good of its victims may be the most oppressive.... [T]hose who torment us for our own good will torment us without end for they do so with the approval of their own conscience.

-- [C. S. Lewis](#) (1898 - 1963)

Chapter 28

Steganosaurus

It was just intolerable. This kind of thing was not supposed to happen. But he wasn't sure what if anything he could do about it, all by himself.

Senator Robert Reynolds sat at his holo-console in the underground office where he'd been moved for "security." That office lay deep in a bunker located somewhere on the outskirts of Helena, Montana. Reynolds had never heard of this facility before, had had no idea it even existed. Sarner's people were everywhere. They looked after his welfare and wants most solicitously, but there was absolutely no mistaking the fact that he was, essentially, a prisoner.

By only his second day here it was also obvious to him that he was receiving filtered reports of events in the outside world. A little judicious experimentation with his outgoing messages quickly demonstrated that the filter was working in both directions. If Sarner was keeping the elected officials isolated, including the President, and redacting their communications with the world and each other, that could only add up to one thing: the Homeland Security Secretary had taken over control of the Federation.

Which in turn suggested that Sarner's people were actually complicit in the horrific events of the third of March. And that implied that Sarner had made some kind of alliance with Reverend Cleary and his fanatics. Some banter he'd overheard amongst the bunker staff provided corroboration, if you listened between the lines a little bit. These people sneered at the KOJ sect's fanaticism some, but they didn't consider them as enemies. That gave the lie to the cover stories disseminated in the press about the KOJ having caught the government flat-footed.

Official embarrassment always led to a desire on the part of officials to get even. The fact that the Homeland Security bunch evidenced no genuine need to go out and stick it to the KOJ testified eloquently to their having been in it with them from the beginning.

Which had left Reynolds uncertain as to where to turn. Communicating openly with the other members of Congress or the President was plainly out of the question. His captors were being pleasant only because he was acting as stupid as Sarnier obviously believed him to be. If he tipped his hand, they would watch him even more carefully, or worse. Up to now he'd played along acting as if he believed that the danger from KOJ terrorists was real and the Federation government was the only viable means of rounding them up and stopping them. He knew Sarnier was getting mileage out of that, and it galled him. But now it looked as if the pretense was about to be dropped, and that worried him. Sarnier's men had started going house-to-house through urban neighborhoods, destroying cyberverspace equipment themselves. Publicly these raids were still being blamed on the KOJ, but the authorities' total inability to do anything to halt them was straining credulity, even in the unimaginative courtesan press.

In the past month it seemed he'd worked out a hundred schemes for getting somebody outside to understand exactly what was going on, and he'd reluctantly discarded them all. Any message plain enough to do the job was bound to be intercepted and "edited," to say nothing of tipping off his captors that he was not the stooge they thought him. So for a long time he pondered saying something subtle, via innuendo, to someone who knew him well enough to detect it. But unfortunately, all of the people who fell into that category were colleagues who were in no position to help him, being in much the same circumstances as himself.

Actually, there *was* one person who might be able and willing to help: Justin Turrell. The trouble there was that Justin was very much the enemy that the government was working against for real, and anything Reynolds put in a message to him would undoubtedly be scrutinized very carefully. In

fact, it likely would never even get delivered. Unless, of course, it said something Sarner might want Justin to hear.

So today Reynolds had constructed a very carefully worded appeal to Justin to suggest a meeting, in the flesh in meatspace, as they had done before. Clearly they had some business of mutual advantage to discuss, regarding the suppression of the KOJ forces who were afflicting the cyberverses and the Sings. Reynolds was willing to bet that Sarner wanted to get his hands on Justin badly enough that he might just let the message go through. Though naturally he wouldn't expect Justin to accept. Neither did Reynolds. Presumably the Sing ambassador knew what was really going on well enough to suspect that the invitation was a trap. Still, it was the best idea the senator could come up with.

Since there would probably be no reply or future dialog, he had to embed whatever else he wanted to tell Justin inside this one message. The other day it had occurred to him how he might achieve that. The people Sarner would have monitoring his communications would be Moshes, because that was all Sarner really trusted. He wouldn't have an automated scanning system do the job; it would be some of his captors right here in the bunker. Which meant that Reynolds need only put something in the message which Justin could detect but Sarner's eavesdroppers would not.

One of the benefits of studying legislative history as thoroughly as he had done was that he knew a lot about obscure laws which had been enacted in the past. In the USA, many years ago, before there was even an internet, some laws had been passed by Congress forbidding something called subliminal advertising. This involved written words or images which flashed by too fast to register in the conscious mind of the viewer, but which lodged in the subconscious. Reynolds was reasonably confident that a Full Sing would be able to pick out such a subliminal subtext. Still, he had to be careful in case his watchdogs did too. Clearly the subliminal message itself had to look innocuous in case it was discovered. To say nothing of the fact that there was surely an audio bug planted here in his office.

Finally, he'd hit upon the answer. More than two decades ago, his wife Marguerite had insisted that he learn sign language. They'd studied and practiced it together. Given the existence of ubiquitous automatic language translation devices, which could provide written subtitles on the world for anybody, learning sign was quaint and old-fashioned even then. Today hardly anyone would know it, or even recognize it for what it was. Justin might not know it either, but he would at least recognize it, and could probably look it up and teach it to himself in minutes.

So all day today Reynolds had sat in front of his console, painstakingly editing an overt message to Justin. He made sure to gesture and fidget with his hands and fingers a lot as he recorded takes. Independently, he recorded a silent second message, all in sign. Then he extracted significant single frames out of the covert message and inserted them within the longer message at random intervals.

As he played back the finished take, Reynolds looked anxiously for any sign of flicker or jumping that was perceptible to his senses. But at one hundred frames per second, he couldn't detect any. Satisfied, he deleted the covert message. Then with a weary sigh, he signed and encrypted the vidmail, and sent it off to Justin's coordinates – fully aware that his signing key was compromised by Sarner's people, and that therefore only they, and Justin, would be able to view its contents. Encrypting important messages was standard practice, and outwardly Reynolds maintained the appearance of belief that his encrypted data was secure. However, the government's insistence that it set a good example for the public by exclusively using ciphers which supported a key escrow system, guaranteed that it was not.

The public had always rejected key escrow schemes, out of innate distrust for the escrow custodians – particularly when those worked for the government. While the government had always maintained that if you had nothing to hide, you had no reason to object to key escrow. Thinking of Roger Sarner, Reynolds was now forced to admit that the public had been right.

The senator rose from his desk, finding no need to pretend that he was worn out. He called a weary but cheerful good night to his supposed “secretary” that had been assigned to him, out in the outer office, and received a muted, distracted, and mostly unintelligible response. Reynolds walked down the carpeted hall toward his own spacious and comfortable underground apartment. Inside, he got ready for bed immediately. Lights off, he lay in the dark letting his secret message play over and over in his head, seeing the hand signs in his mind's eye, imagining Justin watching it with comprehension.

“Justin: I'm captive in a HS facility near Helena. Other officials captive too. We are kept separated and our communications are watched. Sarnier is working with the KOJ. Please ignore main message. Any such meeting would be a trap. But if you can spring me, I will denounce Sarnier. That should help take the pressure off and weaken him. I fear he is going to escalate. May even go for nuclear option. Too many old weapons still around. I hope we can help one another. Hope you're well. Best.”

Feeling more hope and less despair than he had in some time, Senator Reynolds fell into fitful sleep.

Good advice is always certain to be ignored, but that's no reason not to give it.
-- [Agatha Christie](#) (1890 – 1976)

Chapter 29
Merry Meet Again

Cylara walked briskly down the darkened street, senses alert, though her mind was preoccupied with anticipation concerning the meeting that was about to occur. She wasn't expecting trouble here in town. But if any found her, she was prepared. She was packing, and had been practicing assiduously with her Cyberantes squad. The evening was cool and moist, effects leftover from the afternoon's rain, though the night sky was mostly clear. Hard to believe it was already the first week of April.

The air taxi had dropped her off in an empty lot a few blocks from her destination, which was a small, intimate club she'd been to a number of times before during the seven plus years that she'd lived on the outskirts of this little town. She was going there to meet Torch, in the flesh, for the first time.

Her emotions were mixed, to say the least. On the one hand it was very moving that her guy wanted to get to know her so completely and thoroughly. On the other, there was something almost creepy about the idea that her meatspace body and persona was the real her. Yet that was the sense that she got from Torch, that he cared about her so much that he just had to get to know the “real” Cylara. Flattering and vaguely disturbing at the same time.

How exactly was this any more real than myriad places they'd met before? It certainly wasn't more upscale. The little club was in sight now, just down the block and across the street. Its sign was lit, so it must be open. Which was a good thing: it had been more than two years since she'd last visited the place, and a lot of meatspace businesses were vanishing these days. There was no ground car traffic, so she simply steered diagonally across the street toward the door, her heels tapping steadily

across the fraying pavement.

She pulled open the door, entered, and unwrapped her scarf as she stood at the front. The place was dim, like she remembered it, all the paneling and tables made of dark wood. Booths lined the walls surrounding the open dance floor. There were also cafe tables and a long, polished wooden bar ringed with stools. A couple of the booths were occupied and a few folks sat at the bar, but the establishment was far from busy. Light flooded from the kitchens in back, partially blocked by a set of swinging doors. Canned music was playing, not too loud; evidently there would be no live music tonight.

Cylara moved to take a seat at the bar, far enough away from any of the other patrons to avoid the appearance of inviting conversation. The bartender looked vaguely familiar to her, a well-muscled black dude with a shaved head. He smiled at her and swiped the bar in front of her with a damp cloth.

“What'll it be?” he asked, and at the sound of his voice she recognized him, though his head had not been shaved the last time she'd seen him. On that occasion, two and a half years ago, she'd let him pick her up and gone home with him when the club closed.

She returned his smile coolly. “White Russian for now. I'm expecting a friend to join me.” Best to head off any expectations he might be forming, and put any patrons who were listening on notice too.

He smiled again, nodded, prepared her drink. “Five hundred ameros,” he said as he served it to her.

Cylara was a bit taken aback. On her way out of the house, she'd raided her desk for all the meatspace money it had contained, which came to about eight thousand. Two years ago that would have bought rounds for a packed house, many times over. Damned government paper currency, what a waste. And these were what, new new ameros, second revaluation? Must be time for a third. She took a one thousand amero note out of her purse and handed it to him, and he made her change. If Torch planned to order

food, she hoped he brought money of his own. The circumstance of being in a club, feeling antsy and with limited resources, suddenly struck her as amusing. Page from the album of her youth.

The White Russian was good, tasting just as it did in any decent simulation. She had to remember though that too many of these would impair her brain function, unless she explicitly instructed her nanites to clear it. Maybe it was just as well that inflation had made her poor. She'd come here to meet her lover, not get drunk with him.

Not many sips into her drink the front door opened, and a man walked in. He had dark brown hair, green eyes, strong, chiseled features, and was wearing dark jeans and a forest green turtleneck, with a worn but stylish black leather jacket over all. Which meant that this had to be Torch himself, based on the description he'd given her. He looked around and quickly spotted her, "the blond in blue at the bar," and walked over with a smile. She waved, picked up her drink, and slid off her stool onto her feet. She had no intention of trying to hold a private conversation sitting at the bar.

They met for a brief one-handed embrace as they said hello, then headed straight for an empty corner booth in the back. As they got situated facing one another, Cylara experienced a moment of uncharacteristic nervousness. Somehow this was awkward, despite how well they knew each other. Torch covered one of her hands on the table with one of his and squeezed it gently as they looked into each other's faces.

"Wow, Cy, you're as gorgeous in real life as your virtual self," he complimented.

She made herself laugh. "I told you I was. You're not bad looking yourself."

He smiled, released her hand. "Thanks."

"So, you want to order something? I better warn you, this drink here cost me a sixteenth part of all the meatspace money I have in the world."

Torch laughed. "They'll take cyberverspace money, you know. Aurumnet if

nothing else. Everybody has to these days. Anyway, not to worry, I've got plenty."

"Good. So what are we doing here, Torchy? We could have met anywhere else, so why here?"

A waiter appeared at their elbows with menus, so they took a moment to order some food. As the waiter retreated, Cylara looked meaningfully at her boyfriend, referencing the question still hanging.

"I told you why. Because I love you and I want to get better acquainted with you. All of you."

She shrugged. "The only part of me you don't know yet is this body. And as you've already noticed, it's not that different. I haven't been another person with you, lover, just because I could have. You already know the real me, as well as anybody does."

"But when you love someone Cy, you want to know all about them. Not just what they look like, but where they live, how they dress, how they move and speak, the things they like, where they grew up, who their friends are, their family, their hobbies, their pets. I want to know how you live in real life."

"Well to begin with, I don't spend much time in real life these days. I don't like it as well. It's so plain and unchanging. Too boring, a bit depressing actually. And you already know quite a few of my friends and some of my family. I don't have any pets, unless you count my mining robot."

Torch grinned. "Don't you think you can tell a lot about somebody, from where and how they live? I mean, from their chosen surroundings?"

"But I barely live there. Just ask Paia. I haven't changed anything in years."

"I'd still be curious to see your place."

Cylara awarded him a measuring glance. Abruptly, she opened her coat and pushed it back off her shoulders, shrugged out of it, and straightened her dress. She was wearing a dark blue satin number, with a neckline so

plunging that it looked like the dress didn't even start in front until it reached the bottom half of her bustline. Cylara's breasts were not huge, but well-supported from beneath in a demi-bra, they tautly filled the top of her dress and formed impressive, deeply sculpted cleavage that swelled gently with her breathing. The dress tapered out of sight below the table to her trim waist and firm, curving hips.

“Is this what you're really curious to see, darling?” she asked after she'd let her impact register for a few moments. “Are you working up to suggesting that you come home with me, so that you can nail me to my mattress in the flesh? If so, you can be more direct. You know this body is already yours.”

Torch, his mouth suddenly dry, pretended nonchalance. “Well, I did have that in mind for later, I'll admit. But really, I just wanted to find out what you're like in real life. To see if you're really still you, I guess. Somebody I'd love, as a woman, the way it used to be.”

Cylara ran both hands through her hair, bending forward for a moment as she did so, then sat abruptly back up straight and shook her hair from side to side, making an exasperated noise. “You frustrating humanoid. I can't understand why. It's not like we're ever going to live together in meatspace.”

Torch did not reply for a moment. For one thing, in bending over she'd flashed him her magnificently erect nipples. For another, he wanted to frame his response carefully. For a third, the waiter was approaching with their order.

As they tucked into their full, steaming plates, everything was of course delicious. Naturally the club staff did not do any cooking; they merely operated MM units in the back, which swiftly turned out perfect replicas of meals originally scanned from the finest creations of master chefs. Around a mouthful of stuffed veal cordon bleu, Torch offered his answer.

“I can imagine circumstances where we might have to live together in meatspace.”

"You can? Such as?"

"What if the cyberverses were destroyed?"

Cylara put down her fork and downed the rest of her drink from the bar, giving him an incredulous look. "How could that possibly happen?"

He shrugged. "The government and the KOJ."

"They won't win. Their little reign of terror is about over, in fact. You've joined the Cyberantes too. You know what we're going to do to them next time they try something."

"I know. But what if they resort to nuclear or biochem weapons of mass destruction?"

"Well then meatspace is the last place we could live. It'd be poisoned. We'd probably have to become Full Sings. Or die, and hope we get restored by the Last Trumpet gang."

Torch shook his head. "I'm not sure I'd want that. Does your soul go with you when you get Scanned?"

"You said something like that to Art when we met him. I'd like to know what evidence you have for the existence of this soul thing, or why you seem to believe in it. Because I know I don't."

"I guess you can't prove it. It's just an article of faith, I suppose. Faith is the evidence of things not seen."

"Sounds more like the ability to believe in things you know are not true."

Torch chuckled. "I suppose it depends on your point of view."

"Only if your point of view doesn't care about factual evidence."

"Don't you think there's more to life than scientific truth?"

Cylara thought for a moment, taking a mouthful of food to fill the pause. "Of course there is, if you mean feelings, such as love. Life isn't all cold rationality. We'd never enjoy it, no matter how smart we became. But I don't think that means that you can just opt to abandon all logic and evidence and believe whatever you decide to believe. The evidence is, that people like Art are fully complete beings. They possess everything that could possibly be included in the definition of a 'soul'."

"I'm not sure I agree. But we needn't fight about it."

"I don't want to fight at all. I guess if we're supposed to get better acquainted, we could do that. I was born in Serbia in 2002. My mother was American, and things weren't good in the old country then, so we moved to the US when I was two. I grew up in Fresno, California. I was a moderately successful fashion model, later a fashion designer. As you know I still do design for a living."

"My God, you're forty-three," he laughed. "I'm only twenty-six."

Cylara had to roll her eyes and laugh too. "What difference does that make, anymore? We'll both live for centuries. As long as we want to, really. And it's not like I'm going to get old on you. You think you can find a twenty year-old girl somewhere with a hotter body than I've got?" she asked with a mischievous widening of the eyes.

Torch grinned. "Not bloody likely, baby."

"Right answer. One thing I'm curious to know about you, I have to admit. Your real name. I mean, your nickname is all about your flaming ginger hair, and yet here you don't even have red hair."

"I thought about dyeing it for you," he confessed, and took another bite off his plate. "Daniel," he said after he swallowed.

She raised an eyebrow. "Oh, really? I have a cousin and a brother-in-law who are both named Daniel. Not sure I'll get used to that easily."

"I'd just as soon you didn't, actually."

"What, the guy who wants to know all about the truth of my real existence, prefers to go by an assumed name?" she said, teasing.

"You can call me Daniel when we get together here. When we meet up in the cyberverses, I prefer Torch."

Cylara stirred her remaining food around with her fork. "Lover, we're going to finish our meal, maybe have a dance or two, then catch a taxi to my place. I'm going to unleash this forty-three year old sex-goddess body to screw your brains out, then we're going to catch some sleep. In the morning we'll go our separate ways, and we'll continue our relationship in

virtuality. So I guess I'll be continuing to call you Torch. Please understand, I'm just not interested in a meatspace boyfriend. I spend most of my time in the cyberverses and that's where I want to be with my guy. It has just so much more to offer."

For a heartbeat Daniel looked rueful, but then brightened and spread his hands in a gesture of agreement. "Sure, that's fine. I always enjoy our time together, too. I just felt I had to see you, once."

She smiled. "You can do more than just see," she said, and rose fluidly from their booth, took his hand, and led him onto the dance floor just as a slow song was beginning. Soon they were standing entwined, more rocking and shifting than dancing. Cylara slowly rubbed the top of her right thigh against the crotch of his jeans. Daniel gave a slightly nervous chuckle.

"I'm afraid I'm not quite as... well, not in real life," he said a little sheepishly.

She laughed and hugged him harder. "You think I am? That's one thing I had to adjust slightly on my virtual self. You guys with your avatars! It would be uncomfortable otherwise." He had to laugh too, and spun her around for a playful dip.

Before long, they both wanted to head out. Daniel took care of the bill, pulling out an amero payment card. Cylara was impressed in an odd way; hardly anybody carried official bank cards anymore. The bartender had to rummage under the bar for their reader machine, and boot it up. He gave Daniel a calculating look, though whether because of his choice of tender or because Daniel was plainly taking his one-time bedmate home, wasn't obvious. Soon they were in an air taxi, rapidly covering the dark twenty-plus miles to Cylara's house.

When they arrived, for a moment Cylara feared he was going to ask for a guided tour of her home, but he had the good sense not to. Instead she gave him a guided tour of every delicious inch of her body. The sex was hot but in truth not as good as what they typically shared in their virtual avatars, for either of them.

Afterward, as they lay companionably in her big four-poster king size bed, Daniel drifted off to sleep first, leaving his lover musing in a twilight state. She thought how odd it was to be sharing this room and this particular bed with a man, even with this man. She wondered whether she'd ever do it again.

Torch's insistent interest in having a girlfriend in meatspace, coupled with his pessimism about the future of the cyberverses, remained vaguely troubling to her. Was one of them a result of the other, and if so which? And where did he get this penchant for irrational, unsupported belief in things like souls? Childhood upbringing? It was the sort of thing one would expect from some ultra-conservative Mosh. Yet she knew Torch wasn't like that. His body was almost as cybernetically upgraded as hers was. He too lived mostly in the cyberverses. He was clearly no Mosh.

It was a puzzle. But then, quite frankly she was frequently a puzzle to herself. She could ponder it all later. Right now, sleep beckoned her sated body.

Ignorance feeds on ignorance. Science phobia is contagious.

-- [Carl Sagan](#), *The Demon-Haunted World: Science as a Candle in the Dark* (1996)

Chapter 30

Beating the Odds

The heat shimmered over the quiet Las Vegas side street, despite the fact that it was still only early April. Bright afternoon sun baked the exterior of the large beige vehicle parked at the crumbling curb. A combination air and ground vehicle, a solar-powered hybrid the size of an antique motor home, it served as a mobile nanoclinic. Customers seeking the services of its proprietors were given its current GPS coordinates and made their way to points nearby via robotic air taxi.

Business was slow today. In the three and a half hours the vehicle had been parked there, no more than a handful of customers had approached. Perhaps the heat of the day was keeping the clientèle away. Vegas natives frequently preferred to defer their business until after sundown.

A large group of men in dark clothing appeared around the corner, moving in step together like marching soldiers. These guys did not look at all like prospective clients. Despite this, when they noticed the parked clinic, they changed course slightly to move directly toward it. The men began moving double time, fanning out into two groups of about a dozen each so as to approach the vehicle from both sides.

One of the staff looked out a window to investigate the sudden surge of blips on their proximity detector screen and saw the approaching squads. Her eyes widened and she called out: "Trouble, Tim!"

"What's up Bianca?" Tim queried, sticking his bald, tattooed head up the stair from below where he had been walking past.

"Troopers incoming, looks like feds."

"Shit!" Tim said with feeling, and disappeared, running for the control cockpit.

Bianca called down the passageway after him: "They're all armed!"

They'll shoot us up if you try to take off."

"I'm not taking off, I'm hitting the distress beacon," Tim hollered back over his shoulder. Moments later, a determined, rapid pounding began on the exterior door. Someone knocking without pausing to wait for an answer, keeping up a steady, authoritative barrage. Bianca crept downstairs and Tim met her returning.

"We have to open up," she said calmly. "They'll just blow the door if we don't."

"Yeah," Tim agreed, and moved to do so. The instant he touched the control and the door slid open, about ten dudes surged inside, automatic weapons at the ready. Tim and Bianca were down on the floor in hammerlocks in seconds while other men spread out fore and aft, practically sprinting, covering each other in pairs as if they expected to find hidden opponents, barking at each other in loud, adrenaline-charged voices. There was no one inside but the two staff members, who were soon out kneeling in the sunlight with a dozen guns trained on them.

The commander came over and looked at their IDs, as these were handed to him by another man who had just filched them out of their pockets. The officer, wearing captain's bars and unfamiliar yellow logos of some kind on either side of his collar, scanned the cards and scrutinized the display in his palm for only a few moments. "Illegal nanoclinic, eh?"

"There's nothing illegal about it, we have a franchise charter, it's on the wall right by the door," Tim said with unfeigned exasperation. The captain gestured, and one of the men rapped Tim smartly in the back of the neck with his rifle butt, and he pitched forward with a groan.

"You're behind the times," the captain said cuttingly. "You make people into monsters. That's illegal now." Bianca looked up at him with slitted eyes and a hateful expression. She was a tiny thing, barely five foot, with shoulder length brown hair. More than one of the troopers had already noticed the nicely rounded shape of her petite frame. Her fierce, defiant expression told the captain everything he needed to know about her

attitude. An unrepentant sinner. Shame.

“Cuff him,” he ordered. “As for her, escort her back inside and a couple three of you take the sass out of her.” The men chortled as they wrestled Bianca back to her feet. With a snarl and a demonstration of remarkable augmented strength, she wrenched her wrist free and stiff-armed the man standing in front of her. He flew backward nearly ten yards and landed on his ass with a woof. Four others jumped her from all sides, wisely lifting her off her feet to break her leverage. Even then her lashing limbs administered plenty of bruises until one of them bashed her upside the head with his rifle butt, hard. Almost out, blood streaming into her eyes and roaring in her ears, Bianca could only twitch feebly as they flung her back onto the floor of the clinic where she worked. A certain numbness began to enfold her as they stood her up against an interior wall. Vaguely she heard the sounds of her clothing ripping, amid vicious laughter, but she couldn't feel it. She heard what sounded like Tim's voice screaming in the distance, suddenly cut off.

A series of sharp reports sounded, outside, followed by more screams and yells. Abruptly she was no longer being propped up, and slid to the floor, semi-conscious. After a moment she managed to roll onto her back, and lay looking at the ceiling, which swam dizzily in her vision. A wave of nausea rolled over her and she had to close her eyes tight to shut out the spinning. More loud reports. Gunshots?

And still more yelling. Urgently shouted commands, curses. More bursts of what she realized now must be gunfire. Faint vibrations in the metal floor beneath her, a hiss like air from somewhere. Still struggling to find her center against the vertigo, she opened her eyes. Daylight leaked onto the floor from a dozen point sources in the walls, which had not been there before. God, they must be shooting through the vehicle, she realized sluggishly, and managed to roll onto her side, facing the open door. She couldn't see anyone, but there were still occasional shots and cries outside.

After another minute or two of deep breaths to collect herself against the

nausea, Bianca succeeded in crawling across the floor so she could look out. Two troopers in dark uniforms lay on the ground in her field of vision. One was groaning, the other was still. Tim lay on his back, eyes wide, staring straight up at the sky. His mouth was open but he wasn't shouting now. A scarlet pool framed his bald head on the pavement. *Oh, God.* She tried to crawl to him, but as soon as she attempted to get up on all fours the disorientation overcame her again and her arms collapsed under her.

Abruptly a gloved hand, light but strong, was touching her head, then turned her over on her back again. She gaped up at a slight figure in some kind of white bodysuit, holding a weapon that faintly trailed smoke and radiated heat. Bianca felt confusion, wasn't sure whether she ought to be afraid. She tried to wipe the blood out of her eyes to see better, but had trouble getting her hand to the right spot. The white figure peeled off its mask to reveal the face of a woman: dark-haired, olive-complected, rather plain, mid to late thirties.

"You're safe," she told Bianca. "We're Cyberantes. Do you have a medical kit?"

Bianca's first hazy thought was that that was a dumb question, but she forced herself to answer it anyway. "Top drawers," she mumbled between lips that still felt a bit numb. "Second cubicle over." The woman hopped up, banged around, was back in seconds. She set her gun down on the floor and opened the kit, began to wipe away the blood Bianca had been having trouble reaching.

"We need to get you to a medic," the woman said kindly. "I'm afraid you're going into shock. I'm Salma."

"Bianca." Then as soon as she could shape her lips around the words she wanted: "Blunt trauma."

"Yes," Salma agreed. "You're a doctor?"

She nodded. Salma turned her head as someone looked in from outside. "Tell Clay we need a transport and a stretcher," she said over her shoulder. The presence at the doorway vanished.

Soon more white-clad people appeared, fussed over her, wrapped her in a blanket, loaded her onto a stretcher, strapped her in, then lifted it by both ends. As they exited the clinic, Bianca tried to crane her head around to see Tim, but she couldn't find him. Salma, who was walking beside the litter, squeezed her hand. "Your friend outside didn't make it. They shot him in the head when we arrived. I'm sorry."

They were walking toward another vehicle, this one obviously a large aircar of some kind. It was unmarked, so it wasn't an ambulance. Looking from side-to-side, Bianca could only see a total of seven people in white. There were a number of lumps in dark uniforms strewn around on the ground near her clinic. None were moving. As they set her stretcher down on a low table inside the car, Salma sat down next to her, still holding her hand, and the others, two men, went back out. Bianca found her ability to think returning. What was it Salma had said they were?

"Cyberantes?" she croaked, her throat suddenly dry. Salma draped a cool, damp cloth over her forehead, then got her a cup of water and held it up to her lips, tipped her head gently so she could drink it.

"That's right. We're the defenders of the cyberspace, against tyranny. We have rapid response teams that can respond to incidents of oppression. Fortunately we were only a few miles away when your alarm came in."

Bianca remembered Tim talking about that. There were special codes and frequencies to call for help if you were being victimized. He'd gotten them an alarm subscription and installed the software on their clinic's communications console just a few days ago. That was what he'd meant by the distress beacon, she realized now. Pity it hadn't saved him. Her eyes began to mist over again, this time with tears. She felt really tired, but knew she should try to stay awake. She forced herself to speak again.

"You killed all the... men..."

"More like animals than men, but yes, we took them out. It was a risk taking on thirty of them with eight of us, but we were able to surprise them pretty well. They were KOJ and Homeland Security, a squad of each. I

don't think they were expecting opposition," Salma concluded with satisfaction in her tone.

A hum of motors and a faint lurch of motion attested that they were now airborne. Flying above Las Vegas. Bianca pictured the Strip as it had been in the old days, when the casinos had drawn tourists by the millions. Almost all of those pursuits were in the cyberverses now, out of reach of those who had always wanted to shut them down. These days the Strip was mostly dark and silent, though it had been recreated in the heyday of its glory countless times in many a simulation.

"You beat the odds," Bianca commented after a while, and the two women shared a smile.

Salma was looking out a window as they banked. "We'll be there in minutes," she said reassuringly.

"I want to join you," Bianca said softly. Salma turned back to her with a quizzical look. "Cyberantes."

Salma smiled and stroked her forehead, a sisterly gesture. "We'd sure be glad to have you. We can always use a doctor, especially one who knows nanomedicine and implants."

Bianca nodded, closed her eyes against another moment of vertigo as their pilot executed a further turn. She saw Tim's face clearly in her mind's eye. He was smiling.

I believe that man must learn to live without those consolations called religious, which his own intelligence must by now have told him belong to the childhood of race.... Man has only his own two feet to stand on, his human trinity to see him through: Reason, Courage, and Grace. And the first plus the second equals the third.

-- [Peter De Vries](#), *The Blood of the Lamb* (1961)

Chapter 31

Standing on the Promises

The stone cavern was vast, as big as a stadium. It was dimly lit in some of its far recesses, but brightly illuminated at the front by rows of powerful halogen lights on poles. It was almost packed with Cyberantes, and more were still filing in. There was a vibrant sense of excitement and anticipation in the air. Clay supposed this was partly because of the tribe's growing list of successes against authoritarian abuses, such as the one they'd scored five days ago in Las Vegas. Now it was time to take the next steps, and everyone could sense it. The group felt its growing muscle.

Of course the excitement could also be due to the presence of one particular speaker on tonight's agenda. Since the Cyberantes were supposed to be an underground organization, one of Clay's associates with a whimsical sense of humor had whipped up this subterranean meeting place. The cyberverses address and access cryptokeys had been distributed to the tribe only an hour beforehand.

Clay saw Salma nearby, chatting with a small circle of fellow members, describing what had gone down in Vegas. As he'd rather expected, her physical person was considerably less attractive than her cyberverses avatar, not to mention a bit older than he'd imagined. Nevertheless the qualities she exhibited in real space, her courage, integrity, compassion, and level-headed determination, were the same ones that he valued most when it came right down to it – in any reality. He was glad that they'd had the opportunity to meet and work together in meatspace, because he'd discovered that he loved her even more deeply, regardless of the face that she wore. He hoped she felt the same way about him.

He couldn't see Cylara or Torch, though he supposed they were in the crowd somewhere. Earlier he'd greeted that lady doctor, Bianca, whom they'd rescued in Vegas. This was her first big meeting. It must be a lot of people's first meeting, judging from the attendance level. Clay guessed that well over eighty thousand avatars filled the cavern now. Impressive turnout.

He'd always believed that a schedule was a contract, so he'd written that into the bylaws. His heads-up chronometer was flashing that it was time to start the meeting, so he moved toward the front where instead of a podium there was a kind of acoustical horn built right into the wall of the cavern. At his signal, the rows of lights in front dimmed and brightened a couple of times. The vast hubbub of countless conversations began to subside, as the attendees all turned to face the front. There was nowhere to sit, for anybody, and this was by design to help keep the meeting short. Clay stepped into the horn and raised his arms for silence.

Fortunately he'd lost his fear of public speaking quite early in his career. Still, he couldn't help but feel some pressure to make sure he said the Right Thing, and not any number of Wrong Things that lurked among his possible options for choice of words. Respectful, interested silence quickly descended and he lowered his arms.

"Thank you all for turning up. For those of you who are new, welcome to the Irregular Army for the Defense of the Cyberverses, also known as the Cyberantes. I'm Clay Thorsten, and I'm a founding member of this very special mesh tribe. I'm not its leader. We don't have leaders by virtue of right or authority. Our leaders in any capacity or situation are those who volunteer to serve, and can get others to volunteer to follow them. So if you're looking for the *Regular* Army of anything, you're in the wrong place."

Some good-natured laughter and amused clapping greeted these remarks. "We now have Tyranny Response Teams, or TRTs, in place in every major population center within the Federation," Clay continued. "Our incident command system has been dispatching those teams as required

whenever subscribers call for assistance. As you all know, we've experienced an early series of signal successes. We hope soon to be in a position to thwart any raid, anywhere, anytime, made by political or religious aggressors, within a matter of minutes."

This produced a groundswell of applause and cheers. "Each of our members is encouraged to volunteer for TRT duty, as many hours per week as you are willing to donate. Those who still require bio-upgrades, combat training, or equipment before they can receive their readiness certification should apply with one of the IADC Paia for information and assistance. Those who are staffing our support, supply, communications, intelligence, R&D, and fundraising positions, thank you. Your help is needed and welcomed every bit as much as TRT volunteers."

Boilerplate finished, Clay moved on quickly to the meat of what the meeting was about. "Our intel reports reveal that Federation anti-cyberverse forces, stung by the successes of our TRTs, are planning a major escalation. As nearly as we can determine, they intend to precipitate a situation which will provoke a TRT deployment. Then they'll throw military hardware and personnel into the fray to overwhelm our TRT, along with any backup that it might summon. They reason that doing this will break the back of our willingness to field teams in response to their acts of aggression."

He paused for effect, and to wait for the smattering of boos to die down. "What they don't realize is that we now have sufficient numbers, together with superior technology and equipment, to meet their military force head on, and smash it. We are, therefore, going to allow this scenario to unfold so that we can break the back of *their* willingness to interfere with the operation of the cyberverse, or with the rights and freedoms of those who wish to inhabit it!"

There came a furious, fist-waving, arm-pumping, foot-stomping cheer which rocked the cavern at this announcement. Most of the members had known about these developments beforehand, but Clay would never

underestimate the effect of stating them publicly so that the emotion of the moment could be felt and shared. If he'd had any need to feel personal power and adulation, the response he was getting would have gone a long way toward assuaging that hunger. But fortunately he did not. He merely wanted the bad guys stopped cold, so that he could go back to his regularly scheduled life.

When quiet returned again, it remained only to introduce the night's special speaker. "On the eve of these stirring events, we have a special guest speaker tonight. Please join me in welcoming the genius whose project inadvertently precipitated this entire conflict, and the best boss I've ever had, Dr. Stefan Jager of the Archimedes Institute!"

Warm applause and whistles greeted Stefan as he climbed up next to Clay and shook his hand, before Clay stepped down and vanished into the front of the crowd. Stefan was dressed respectably but casually, his dark hair and beard neatly combed, his scientist's physique readily apparent in a crowd filled mostly with exemplars of fitness. His deep voice growled out of the acoustical horn, carrying to the back of the cavern as easily as Clay's had, despite its softer tone.

"Thank you for having me. It's amazing and gratifying what you have all accomplished so quickly. The Cyberantes are a testament to what can be achieved when will and principle are united. Your willingness to put your very lives on the line to defend Liberty and the Singularity are an inspiration to all humankind.

"Since you are doing so much for us, for your fellow sapient intelligences, biological and non, we consider that it's only right that we do the best we can for you. We've also made fantastic progress, in the development of what has been dubbed the Last Trumpet Project. And so I'm here tonight to give you my solemn pledge, that anyone who falls in battle against the forces of oppression will go right to the front of the scanning queue."

This time the response began slowly, then abruptly swelled to thunderous applause. Friends and comrades exchanged looks, realizing

that the greatest fear of soldiers and crusaders throughout time, that they might have to die for their cause, had just been removed. There would be no death, and it was for this that they would fight. The symmetry which Stefan invoked was lost on no one.

He waited patiently, smiling, until their response died away. "You need not fear. With your help, because of the things you are doing, knowledge will prevail over ignorance. Science will prevail over superstition. And that which makes us all human, will be exalted into a world without end.

"One word more. As you struggle, I would ask you to remember that mercy and compassion are among the highest human virtues. They do not, of course, require that we perpetually insulate others from the consequences of their own individual choices. But please be mindful of the boundaries of necessity, and do not destroy without need. My deepest respect and sincere best wishes to all of you." With a friendly wave, to more applause, Stefan walked out of the horn's embrasure, returning to the companions he'd come in with.

Clay got up to thank his employer for addressing them, and then entertained a motion to adjourn, which was forthcoming. The IADC prided itself on the brevity of its meetings. So much could be handled through the mesh, via Pias and other communications and detail management AIs, that there was little excuse to keep people hanging around listening to a litany of reports, requests, needs and attaboys that they could easily access and sort through for themselves. Meetings ought to serve mainly social and inspirational functions.

So many people wanted to greet Stefan, or ask him something, that Clay found it impossible to approach him. Which didn't matter a bit, since he'd see him tomorrow morning at their staff meeting in any event. A man with Stefan, whom Clay didn't know, a slender dude with sandy short hair and pale eyes, met Clay's look and gave him a friendly smile and an appreciative nod. Something in the way he did that said clearly: "We'll talk later."

For now, Clay found Salma suddenly at his elbow. She put a warm hand

around his waist and kissed his cheek. "Good meeting tonight," she said.

"Short," he agreed. "With a couple of surprises."

"Best kind."

It is my conviction that killing under the cloak of war is nothing but an act of murder.
-- [Albert Einstein](#) (1879 - 1955)

Chapter 32
The Master Node List

The waterfall made the hot day seem cooler and more pleasant. It was mid-afternoon, and Justin and Petrov sat opposite one another at a table placed near the foot of the falls. Faint tendrils of mist drifted over from the spray to condense on the umbrella covering their table. Tall, cool drinks stood between them. Justin was dressed as if for a leisurely safari, while Petrov was garbed in colorful loose robes and a tall skull cap that recalled his East African heritage. A beautiful pet leopard lay in the shade at his feet, panting in the subtropical heat.

Said Petrov: "I'm concerned about the prospects for continued violence."
"As am I."

"What Stefan has effectively done, by promising to resurrect anyone who dies in the fighting, is to remove any natural abhorrence of killing. It makes death appear cheap."

"Not necessarily. No such offers were made in regard to the other side. In fact the unspoken implication was that if the KOJ men want to be resurrected, they're going to have to rely on Jesus to do it for them. And he did ask the IADC to limit destruction to the minimum that was truly necessary."

Petrov sighed. "None of which is going to reduce the level of violence by much when this pending military confrontation plays itself out."

Justin shrugged. "I agree, but what would you have had Stefan do? Decline to offer the Project's help to preserve people who get their biological bodies destroyed fighting on the right side? That's how he sees it."

"If we're the right side, Justin, then surely we can find a way to avoid fighting at all. Violence is not an intelligent solution. So long as it's

employed defensively it may be morally justifiable, but it's still not intelligent. In fact, it brings our people down to the level of the state."

"You know, I had the distinct impression last time we got together, that you had some idea in that regard." Justin smiled, knowing full well that this must be why his friend had invited him here.

"I did," Petrov replied after a moment and a taste of his cocktail. "Something Shanti said, that it would be good if they fought us on our own ground in the cyberverses."

"I remember. But how is that possible?"

"It's possible if they perceive a vital objective which can be achieved only in virtuality."

Justin pondered this for a heartbeat. "Such as?"

"A key that will give them undisputed, convincing victory."

"There is none, Petrov."

Petrov grinned. "Of course there isn't. But it's only necessary that the Moshes *believe* in one.

"Consider what we know about their mindset. The political class, like Sarner, believe in the innate superiority of centralized, planned solutions to problems, implemented through the exercise of authority. The religious adherents, like Cleary, believe in the inevitability of victory through the exercise of divine will. They expect that a means to victory *must* exist, and that it shall come to pass, as they say, that God will in due course reveal it to them."

"All right, stipulated."

"So what if there was some piece of information, which could only be found in the cyberverses, that would enable them to uncreate it once they gained access to it?"

"That of course is absurd, but did you have something in mind?"

"Yes. What if there were a master list of all the nodes in the cyberverses, an address book for the entire system, which would tell them the GPS coordinates where every simulation was hosted, where everybody like us

lives, and the list of storage devices where any given data file is stored?”

Justin was floored by this suggestion. He paused for a gulp of his drink before replying, as if he needed to recover from the shock before he could speak. “But Petrov, they're not complete fools. They know all about DR.OS. Hell, the complete operating protocols are published openly all over the place. It's no secret how the system works. It's open source, for crying out loud! Even a Mosh programmer ought to be able to look at the facts and deduce that what you've just described is the polar opposite of how the system is actually implemented.”

Petrov laughed cheerfully. “Of course! But what we need to concern ourselves with is how these *particular* Moshes, especially their decision-makers, will receive this information. I believe I've worked that out. Just as I knew that you, Justin, would find the notion utterly unbelievable. You're too intelligent, and too driven by the recognition of facts. You don't let what you want to believe override the things that you know to be true. But in this case I fear you're letting your own rationality seduce you into underestimating the self-deceptive capacity of our opponents.”

“In that case,” Justin said with a slight suggestion of a seated bow, “I had better listen attentively while you explain why our opponents will find themselves compelled to believe such a fantastic story.”

Petrov smiled. “We've already seen some evidence,” he began, “that the Moshes don't really grok the mesh: specifically, their surprise at how little permanent damage their Operation Skull Fracture did to virtuality. You said it yourself at our last meeting. They're ignorant of both the principles of self-extending geodesic computer networks, and of free market economics. Anyone who did understand those principles, who truly grasped the nature and genius of DR.OS, wouldn't have expected to deal a knockout blow. I suspect that a similar unpleasant surprise awaits them whenever their first significant battle versus the Cyberantes takes place. It would never occur to them that an upstart mesh tribe, organizing spontaneously in response to their own authoritarian abuses, could so rapidly accumulate the

wealth, technology, skills, numbers, and leadership required in order to kick the collective ass of their antique, rigidly centralized military.”

“It certainly occurred to me. In fact I expected it, and I said as much.”

“That you did. But that's because you have something which an authoritarian lacks. Namely, a faith in spontaneous order.”

Justin nodded slowly. “They like to think that the only way things can work is if they're centrally planned and controlled.”

“Exactly. Which is precisely why they'll believe in the existence of a Master Node List. From their point of view, it's the only way something as vast as the cyberverspace could possibly work. The fact that the published protocols don't speak of any such thing is because it was necessary to conceal the truth, so that no one would ever try to seize the List. And because you, Justin, are a hypocrite.”

“Actually, of course, I aspire to rule the world,” Justin said smiling.

“Aha. No doubt. And as for the religious Moshes, they'll quickly decide that this secret vulnerability – once it gets revealed to them in a way that suggests divine intervention – constitutes their expected hidden pathway to the inevitable victory of the righteous. Which will look like a doubly attractive avenue to follow after they've suffered a few more inglorious defeats in meatspace.”

“So I presume you also have in mind some means of simulating this divine revelation?”

“Well I suppose that burning bushes talking, or handwriting manifesting spontaneously on walls, is probably out. An obvious miracle would be immediately suspect. But I was thinking that we might pass the misinformation through Daniel Cleary, the Reverend's son.”

Justin raised an eyebrow. “Didn't know he had a son. Is he given to having visions?”

“Not exactly. But he has been functioning as the KOJ's principal spy planted inside the cyberverspace.”

“You're kidding me. A KOJ, living in virtuality?”

“Special dispensations. Only his family knows he's been leading a double life. Even Sarnier doesn't yet know who the inside man is.”

“You speak with certainty.”

Petrov shrugged. “Some of my newer creations have the capability of detecting bugged avatars. Young Cleary came to visit several of my latest virtualities wearing a trace that connected back to Ferret. I considered this unusual enough that I tracked him back to his jack to find out who and where he was.”

“Clever. And quite conclusive, I must admit.”

“After that, it occurred to me that building him up as a trusted source who obtained useful information might pay dividends down the line.”

“Of course. What information did you give him?”

“Well, I arranged for one of my systems installers to hand him a cryptokey with the Singularity crest on it. He also intimated that it led to a habitation being prepared for the resurrected dead. In reality it went to a late 1980s New York City simulation which was put up for a nostalgia tour, and had recently been decommissioned. But I reprogrammed the supervisor AI to offer Cleary and his friends some very significant jargon suggesting that we – or someone – was able to track everything that went on in the whole cybervers. A spew of implausible nonsense, but which implied the existence of an omniscient mesh superpower somewhere.”

“You fox. You've been planning something like this for months.”

“Since you asked me to provide housing for the Project's clients, in fact. It occurred to me that the hosting for such virtualities might be subjected to attack. At any rate, the others (Daniel's Sing friends) naturally discounted it all, and I'm not even sure that Daniel bought it, entirely – he's beginning to think independently of his upbringing, given constant exposure to other modes of thought. But the important point is that he reported this strange experience to his father.”

“Right,” agreed Justin. “Hence the elder Cleary will now be predisposed to believe anything which appears to make sense of that which made no

sense before. So who are these friends that young Daniel hangs out with?"

"Ordinary bio Sings. Chiefly his girlfriend, and Clay Thorsten, and Clay's girlfriend. The two couples seem to double-date a lot."

Justin's jaw dropped. "The Clay Thorsten who's been organizing the Cyberantes?"

"The same."

"Oh, boy. I just saw Thorsten last night, at Stefan's appearance, though we didn't get a chance to speak. That means Daniel has access to—"

"To all kinds of useful information, yes. Where necessary, I've taken care to make certain Daniel doesn't gain access to anything too critical. It's been much easier to do that since the demise of Ferret, since they can't really trace his movements anymore. For example, I made sure to have Stefan set up the meeting of Daniel Cleary and his friends with Arturo Scalleni in a special virtuality used solely for that purpose. By coincidence, Scalleni is the first cousin of Clay's girlfriend Salma, so that meeting was certain to occur. I took some old hardware that the company was decommissioning, and threw it out into a brand new site in the middle of Labrador. I guessed that Daniel's tap would lead Ferret right to it, and sure enough they blew it up on 3/3. Doubtless thinking it was a state-of-the-art hosting for Last Trumpet people such as Art."

Justin shook his head, now chuckling with admiration.

"It gets better," Petrov went on, grinning. "At that meeting, Art mentioned that he'd been a murder victim, and that we knew about it by the expedient of turning the Cronus Scanner on the dam. Young Daniel goes screaming back to his daddy with this news, daddy tells Sarner, and next thing you know Operation Skull Fracture comes together almost overnight."

"So after these bits of choice intel which have proven reliable, anything we leak through Daniel is bound to be treated as pure gold."

"Precisely." Petrov reached down to scratch his pet's ears.

Justin thought for a minute, considering the angles as he slowly took another drink. "Do Daniel's friends know who or what he really is?"

Petrov shook his head. "No, they know him only as Torch. Though I think his girlfriend, Cylara Janovic, may be beginning to form some suspicions. On the other hand, the two appear to be falling very much in love."

"Daniel is in love with a Sing woman?" Justin looked a tad incredulous.

"Apparently so."

"How perfectly scandalous. Is there any chance that relationship could induce him to abandon his father, I wonder?" Justin pondered.

"Possible I suppose, given the right circumstances. We can predict with some certainty the way the mind will react. But even we can't predict the choices of the heart."

Justin grunted agreement, still engrossed in thought. "The quest for this mythical Master Node List will not only lead some of our opponents to venture into the cyberverses seeking it, it will also cause them to cease their efforts to destroy random servers," he said steadily. "They won't want to risk inadvertently destroying the one that contains the List."

Petrov nodded. "Or the ones presently hosting their avatars while they search for it."

"Which means that we'll get the cease fire we wanted, along with a reduction in confrontational violence. The Cyberantes will only react to the illicit use of force; they won't initiate any themselves."

"Of course."

"And that buys time for Riksana and I, and the rest of our team to finish our work. A couple months is all we need, perhaps less."

"Indeed. Delaying the radical Moshes plays into our hands. Not to mention the fact that the longer their rank and file spend in the cyberverses seeing what it has to offer and how people actually live there, the less committed they are likely to be to destroying it. Do you perceive any chance for a political solution, Justin?"

"Funny you should ask that. Perhaps there is. Recently I've had some peculiar contacts with Robert Reynolds, a Federation senator. Eleven days

ago my Paia gave me a pair of messages from the man. She told me one had been cleverly embedded within the other using steganography. The outer message requested a meeting with me to discuss negotiating some kind of settlement with the government. The inner warned me that it was a trap, that all the elected officials were being held hostage by Sarner, and that all their communications were bugged and their encryption keys compromised. Which only confirms what we'd privately supposed. Reynolds wants to be rescued, and offers to denounce Sarner publicly in return. I've opened a cautious dialog with him concerning the prospects."

It was Petrov's turn to consider. "If you were to keep your appointment for a meeting, it would represent irresistible bait. You, after all, are the person most likely to be in possession of the Master Node List, or at least to know where it's kept."

"True. So now all I need to figure out is how to spring Reynolds, and then get Sarner to start chasing me."

"Oh, that shouldn't be hard for somebody of your talents, my friend." Petrov's leopard was getting to her feet and stretching, and he crooned something at her and patted her head.

"Hard, no. But it's damned inconvenient. I have better things to do, as Riksana is constantly reminding me. I'm sure she won't be too happy about my continued indispensability to the cause of Mosh relations."

Petrov laughed. "Riksana's intensity is a goad to us all, sometimes. But it's only for a little while. Then this mortal coil, as they say, will truly fall off, and fascinating times will indeed be upon us."

"I know. It's the last leg of the race. And if I have to carry the baton one last time around the track, well so be it."

"That's the spirit."

"Petrov, I want you to know how much your friendship and counsel mean to me. As always, you've been a huge help."

Petrov stood up to his full height, and bowed his head in polite acknowledgment. Justin rose too, and leaned across the table to shake his

hand. The big cat suddenly froze, focused intently on something in the brush nearby at the base of the falls. Abruptly it sped away in a silent rush, disappearing at once into the foliage.

“Decisive, isn't she?” Justin remarked.

“Her programming is too simple to be paralyzed by analysis,” Petrov explained dryly.

“Ha. See you again soon.”

“Good luck.”

Justin zoned out via a portal which appeared around him and quickly shrank into the distance. From Justin's perspective, Petrov, still standing by the table at the foot of the falls looking into the brush after his cat as if already lost in thought, dwindled to a faint brush stroke of bright pixels before spinning off into the grey gyre between worlds.

Light never battles darkness, so when you see a fight it is always between two dark forces.
-- [Vernon Howard](#) (1918 - 1992)

Chapter 33
The Battle of Phoenix

The heat of midday beat down on pastel-colored houses, white and stucco roofs, rock gardens and citrus trees, and shimmered over the dark, crumbling pavement. Just a quiet neighborhood in the greater Phoenix area, lined with houses dating back at least fifty years. Many looked unoccupied now, but some were still maintained and obviously inhabited. The decaying streets curved around a golf course, much more challenging to play now than it had once been, owing to increasingly spotty maintenance. A few of the occupied houses still had swimming pools that were filled.

Salma stood in the open doorway of one such house, waiting for its occupants to emerge with some of their belongings. The rest of her team was spread out around the house, or across the street at another occupied home, alertly keeping watch. Up the block, a government aircar bearing NAF insignias burned merrily, belching a plume of oily black smoke. The street around it was littered with black-uniformed bodies.

Salma glanced nervously at the chronometer ticking in her heads-up display. Nearly ten minutes since they'd made the hit. The enemy forces should be converging on their position shortly. The family they were evacuating, a man and a woman and three teenage children, emerged from the back bedrooms carrying bulging duffels.

“Good, get in the airbus quickly, please,” she urged them, and stepped out of their way. The vehicle in question was parked in front of their neighbor's house. It was a large transport which could carry about sixty people and their luggage. Another house or two and it would be at capacity, and would take off for base. The voluntary evacuation was going smoothly, but there was no way they were going to get everyone out of the

forthcoming battle zone before the shit storm started. They were playing a dangerous game.

For what it was worth, Salma locked up the front door. A klaxon sounded in her head and a tactical report streamed across her field of vision. Enemy troop transports and air cover, incoming to their position. Soundlessly, Salma flashed instructions at her team over their chat channel, which they all heard as her voice speaking in their heads. “Take cover, and get the bus out of here now! We'll defend from these four houses, two on each side of the street.”

As soon as the last family made it inside the bus, it lifted off and streaked away, making good speed but holding a low altitude. Its departure was certain to be observed, though. Salma's TRT activated their stealth mode, blending invisibly into the walls of the houses behind their backs, facing up the street toward the burning vehicle.

A roar of what sounded like fighter planes came out of the north and flashed by overhead, followed by a handful of what looked like – no, what *were* – attack helicopters. Behind them were three bulky black transports, about the same size as the airbus that had just departed.

“They've got to be kidding,” the voice of Salma's lieutenant said in her mind. The transports landed one by one, flanking the burning vehicle and its late crew. Troopers boiled out of them, clad in black body armor, carrying high-powered automatic rifles. The helicopters hovered protectively overhead, rotating slowly as their gunners scanned for targets. The Cyberantes' bodysuit armor now blocked infrared signals, so they wouldn't spot any of them standing against the buildings. This was just too good a chance to miss.

Salma gave the next order: “Anti-rotor sawbots, two per 'copter. Your nearest targets, now.” There were five enemy choppers, so ten of her commandos unclipped a grenade-like object from their utility belts and activated them. After a moment to align their self-guiding sensors to the target, they were all tossed into the air. The tiny robots sprouted thin,

silvery chains that spun rapidly around an axis. These were made of jagged nanosteel filaments, resembling the band of a chainsaw. The bots launched themselves at the choppers, moving like darting sparrows. A high-pitched whine cycled upward past the range of human hearing as the rotation speed of their filament chains reached maximum.

The sawbots' AIs guided them unerringly right to the center of the rotor housing, where the spinning filaments sheared off the main steel rotor blades like a buzz saw cutting through a bundle of twigs. In seconds all five helicopters were plummeting earthward, yawing and spinning with engines screaming as they augered in. One of them crashed in the front yard of the house where Salma and several companions were standing. They ducked and turned their faces away from the explosion, feeling the compression wave's heat push them toward the building, and bits of shrapnel bouncing harmlessly off their suits. Fortunately the severed rotors had arced over the house to land a block or two away.

"Anybody hurt?" Salma asked. No one replied. The three transports had disgorged their full troop compliment by now, who had mostly hit the deck when it started raining choppers. As Salma had hoped, two of those had landed amid the enemy force, though with what extent of casualties was difficult to determine through all the smoke and flame. Well, no reason to give them any time to catch their balance. "Detonating charges," she advised. "In 3-2-1-0." She plucked a pager-sized device off her belt, flicked off a safety, and pressed the firing stud.

Immediately the small but powerful explosive mines which they'd seeded in the burning NAF transport, and strewn around it amid the debris in a twenty yard radius, exploded simultaneously. Armored bodies, and parts of armored bodies, blew everywhere.

"Move up and hose them down briefly," Salma commanded. Her force of twenty sprinted toward the reeling enemy troops, who were still hugging the ground looking for cover that wasn't there. At a range inside one hundred feet, where their best new armor-piercing rounds had at least

some chance of penetrating enemy body armor, they broke stealth and swept the enemy with a sustained burst of automatic gunfire. Some troopers were obviously hit, but it was hard to tell which ones because they were all lying flat and still. But when a few prone soldiers began to fire back Salma called a cease fire.

“Break off, retreat south, reassert stealth. I'm sure they have reinforcements on the way.” As they jogged off down the street away from the massacre, those who had deployed sawbots hit their recall switches. The bots, which had remained airborne after crashing their targets, deactivated their deadly spinning nanosteel filaments and flew back to their owners, who folded them up and replaced them on their belts as they ran.

Their team's mission was proceeding nicely. They were to harass and humiliate the enemy, using hit and run guerrilla tactics, forcing the enemy to escalate and pursue them. They would then suck them into a trap where a much larger Cyberantes force would be waiting. The trick was to move nimbly enough to avoid being hunted down and killed before they reached their compatriots' ambush. They were going to have to be more careful from now on just where they crashed enemy aircraft: the neighborhood they were now entering had not yet been evacuated. Salma checked the time again. Probably about half an hour till the real show time. Maintaining a V formation, they jogged tirelessly down the street and faded from view again.

Clay studied his tactical map intently. He was standing in a small vehicle which floated a few feet off the ground, resembling a cross between a hover scooter and a flying pedestal. It had hand grips like a motorcycle, replete with numerous controls, and the large instrument panel behind the windscreen was mainly given over to a wide oval tactical display, which showed position and transponder signals collected from the whole of the Phoenix theater, both on the ground and in the air. For representing this amount of information, an external screen worked much better than his in-

vision heads-up display, and allowed him to reserve the latter for urgent alerts.

Assembled around him were about three thousand Cyberantes infantry, roughly a third of them mounted, as he was, on flying bikes of various kinds. They had taken their position in an open space on a former fairway of the Papago Park golf course, not far from what had once been the Phoenix zoo. A detachment of drones clustered in a grove of sickly palm trees nearby. Unmanned platforms hovered protectively overhead about a thousand feet up, floated aloft by linked strings of evacuated spheres.

The enemy forces were already pushing through downtown Phoenix in their direction. Running skirmishes were in progress in at least four places on the arc along the front, Cyberantes teams maintaining contact only enough to draw the enemy onward. A slight distortion rippled over his map, blurring some of the data there. Enemy signal jamming, evidently.

“Shift to ground bass carrier communications,” he ordered, speaking the words aloud but only for convenience, since thinking them with the intent to broadcast was sufficient to distribute them to the message routing AI. By popular acclamation of the tribal officers present, and somewhat to his surprise, Clay had been given theater command today.

Moments later a bass rumble, like a drumbeat conducted through the very earth beneath them, vibrated on the extreme low edge of human hearing. Those standing on the ground felt it tremble through their feet. About every three seconds it was repeated, a steady thrumming pulse like an immense slow, subterranean heartbeat. Within a pulse or two Clay's display had cleared up.

In response to his instruction, every signaling and scanning device on their side had now switched over to a protocol which utilized the sonic waves being propagated through the ground as a carrier wave. The data was encoded in the noise attached to the main signal, but could not be jammed unless the enemy could silence the carrier transmission itself – a stone impossibility. The only downside was that updates now arrived in

bursts every three seconds, though this deficiency was compensated for by automatic signal buffering.

Clay considered activating some signal jamming capabilities of their own, but decided it was too soon. No point in making it too difficult for the NAF forces to keep together and stay pointed in the right direction.

A group of bogeys sped toward Clay's position on his monitor, a few thousand feet up, sweeping out of the southwest over the old airport. High speed attack aircraft of some kind, ten of them. As they passed overhead they dropped ordinance on the assembled troops. The robotic platforms above came to life, generating intense microbursts of heated air which deflected the projectiles aside so that they hit the ground hundreds of yards off target. A number of nearby houses were abruptly turned into infernos.

Clay signaled for a launch of anti-aircraft drones. Out from among the palm trees a small flock of glittering shapes rose like steel dragonflies and flitted off after the circling planes, accelerating so fast that they flew like angry thoughts. In seconds they were out of sight, but the next compression pulse through the ground showed them on his screen, rapidly closing on the enemy planes.

This particular type of drone did not carry missiles. Rather, it was an enlargement on the sawbot concept. Vastly faster and more maneuverable than any military aircraft ever built – they'd been clocked at more than Mach 15 at sea level – these dragonfly drones need only stroll up behind their targets, which were flying at subsonic speeds, and loop a nanosteel cutting whip around the empennage of each plane. Seconds later it would be without rear stabilizers or control surfaces, irrevocably out of control.

Sure enough, all ten of the attacking aircraft never completed a second pass, instead augering into the ground some miles away from any friendly forces (the dragonflies being smart enough to take targets' trajectory into account when they crashed them). The drones flitted around the battlefield looking for more unfriendly aircraft, following a seek-and-destroy program. Anything hostile which flew into the theater wasn't likely to stay airborne

long, absent new orders to the contrary.

Sensors detected a large quantity of exchanged gunfire, which was highlighted on Clay's tactical map. One of their squads had let the advancing enemy overhaul them a bit too closely, forcing them to turn and fight against superior numbers. Fortunately, this eventuality had been anticipated. There were two much larger Cyberantes units nearby on hover bikes, less than two minutes away. Although it might be tipping off their strategy a bit soon, he could not fail to extricate that squad that had gotten caught. Clay ordered the bike brigades into action to add onto their fight. With a somewhat guilty feeling of relief, he noted that Salma's group was nowhere near the scene, instead withdrawing at a safe distance ahead of another enemy column.

The rebels continued to flee into the suburbs, sliding out east toward Scottsdale. They'd tried to hold the downtown area, but had fled like exposed roaches once the main body of Federation troops arrived. Obviously the anarchists had completely underestimated the willingness of the Federation to commit whatever forces it took to kick their asses. Roger Sarner was still steaming over the casualties from their cowardly ambushes, especially that one involving the helicopters. Well, their hit and run tactics were over. It was run all the way now, run or die. Goddamned Sing insurgents. This escalation was all their fault, really. They wouldn't let law enforcement do their jobs, but kept interfering with their cowardly attacks, and now they had pretty much the whole Federation army after their scruffy butts. Served them right.

Sarner was riding, as a passenger, inside an elite armored command vehicle. This baby was built in the 2020s, not quite twenty years ago, back when they were still coming out with good next generation military stuff, before the tax base had withered completely and put a stop to development. It had impervious nanosteel armor, a main gun with a fifty mile range and

seven firing modes, half a dozen anti-personnel Gatling guns fore and aft, and enough battlefield communications and data analysis capability to keep up with the demands of managing an entire continent-wide theater of operations. This tank, and the handful of others like it, also boasted a magnificent electronic warfare suite, which was even now being employed to keep those Sing bastards from talking to each other.

It used to disturb Sarner that the newest combat gear they had was about twenty years old, and most of it a good deal older than that. But the fact was that in the years since military production had ceased, nobody had bothered to build anything better. Seems the cyber-anarchist types had no stomach for war in the real world, which was, as various commentators had pointed out, a very messy business. The result was that the military legacy which the North American Federation had inherited from the former United States empire, though aging, was still the best in the world. Their only problem was keeping enough of it running, and enough people trained on the hardware, to maintain an effective force in the field.

The Federation forces in Phoenix numbered over twenty thousand men, mostly kitted out as mobile infantry, in armored survival suits linked into the comm grid. There were also hundreds of support vehicles, including a few dozen tanks and armored personnel carriers. Their fighter cover was limited, only about two dozen planes, which was all they could scrape up in a serviceable condition on short notice.

But there were lots more in mothballs in various places, both armor and aircraft. All they lacked was the money it would take to restore them and train up crews. The KOJ boys were working out just great as volunteer soldiers. They could learn anything, and boy were they motivated. Old Cleary might be a prick but he sure knew how to get guys fired up.

The money angle was the bigger problem. Sarner had already hit up the central bank for a massive bond purchase, right after he'd given orders appropriating pretty much the entire Federation budget for the crusade against the cyberverses and its resident terrorists, so that they'd have some

repayment ability. Sure, some people were whining about how the Life Necessities projects were foundering, but Sarner would be damned before he'd authorize expenditures to feed and house idiots who spent their time jacked into the cyberspace. Those people were the enemy, for God's sake! Why subsidize the problem on the government's nickel? That was the kind of thinking that got the Federation into this mess to start with. Unfortunately, the collection of back taxes which had gone hand-in-glove with their cyberspace equipment raids, wasn't producing enough revenue to sustain a military budget.

Sarner shook his head, thinking of the President, with whom he'd had an angry confrontation via video a few days ago. She'd accused him of subverting democracy and basically everything the Federation stood for. He checked his watch. It showed him that in less than forty-five minutes, the President would most likely be dead. A hit squad – carefully disguised as one of those white-clad ninja vigilante groups – was even now on its way to Albuquerque to get him the last word in their argument.

He was seated at a round table which functioned as a data console, alongside three other men: the tank crew captain, the theater commander (one General Nelsen), and one of Nelsen's aides, who mostly relayed orders. As the four watched the dots move around on the tactical map embedded in the tabletop, Sarner reflected that after they crushed these insurgents today, they really ought to give some thought to reasserting the integrity of the Federation's borders. This many men were going to need something to do after this was finished.

The general's aide, an earnest young man with a somewhat nervous manner, suddenly looked concerned at what he was hearing in his earpiece. Sarner didn't bother to ask what was the matter, there being no doubt whatsoever that the boy was going to tell them.

“We've just lost about half our air cover, sir,” he said in an apologetic tone.

“How the hell'd they manage that?” Sarner asked immediately, before

the general could even open his mouth.

“Apparently some kind of anti-aircraft drones, sir.”

“Where'd they launch those from?” General Nelsen wanted to know, this time beating Sarner to the punch. Bright guy, this Nelsen. Ruthless, too. Which of course was why Sarner had promoted him from eastern Homeland Security bureau chief to General of the New Federation Army.

“About here, sir,” the aide said, pointing to a spot some miles away, on a golf course. “It looks like there's a larger mass of enemy troops there as well. Their main force it would seem.”

“How many?” Nelsen queried.

“Several thousand, according to the reports based on the aerial images.”

“Thousands?” Sarner exclaimed in an offended tone. “They're not supposed to have that many vigilantes, or any defensive drones, either.”

“Could they be getting supplied by another government?” Nelsen wondered. He and Sarner exchanged glances. If true, that could explain a lot. “Nevertheless, it's a wonderful opportunity to crush what must be a significant percentage of their forces,” the general purred smoothly. “They're blinded right now with our jamming, so they can't possibly know just how badly we have them outnumbered. But when they see us coming, they'll pull out and run just as they always do. So we're going to need to move in from three sides, so they'll be pinned. I want you to tell the center column to slow up and let the left and right wings catch up on the flanks. Coordinate to move up and attack the golf course at exactly the same time.”

“Yes sir.”

Sarner nodded. The strategy was sound. It would go for maximum kill ratio. General Nelsen certainly wasn't squeamish. Better to get this over with as fast as possible. They had a lot of loyal Federation citizens to avenge. And then it would be on to other business. Like resuming the tearing down of the cyberverses and the rebuilding of the state in the real world.

Salma kept her force loping along ahead of their pursuers, following a ground plot across the map which lay superimposed over her vision. Periodically they dropped out of stealth to snipe at enemy troopers. At that range they couldn't penetrate their body armor, but the tactic did have the effect of preventing them from mounting a headlong rush in pursuit. It was obvious that the enemy was wary of being sucked into an ambush, and her squad was gradually desensitizing them to that danger by staging a series of small, ineffective ambushes. So that when the big one came, they would push confidently right on into it.

One of her party had gotten slightly wounded in the leg by an enemy whom he'd thought dead, but was really playing possum and had gotten off a shot at almost point-blank range. Although limping a little, so far he was keeping up without difficulty, thanks to the medical nanobots built into his suit.

Salma was almost neurotically anxious to bring her entire force through safely. She had never been responsible for so many other lives before, and despite the promise of the Project to salvage anyone who fell, did not want any of her comrades' deaths on her conscience. She could only imagine what Clay must be feeling right now.

The simmering flush of combat adrenaline kept them moving quickly, and Salma had to concentrate to avoid moving faster than the ground plot indicated. She had a vague sense of approaching synchronicity, but couldn't tell for sure exactly where or when the bloodbath would take place.

Abruptly they ran out of ground plot, in front of an abandoned building. They had had no enemy contact for several minutes, and were moving under stealth. Orders sounded in her head, and she relayed them to her team. "Enter the building quickly and hide. We're to let the enemy pass us, then move out behind." That must mean that the ambush site was not far ahead. Salma's team quickly but unobtrusively forced the lock on the door and slipped into the derelict building, hunkering down behind furniture,

oblivious to the dust. They faced the entrance in case anyone came in behind them. Soon they heard and dimly saw pursuing Federation forces moving by along the street outside. Hundreds of them. They were in trouble now if their infrared screening failed.

Salma relayed the facts that they were in position and that the enemy was now streaming past their location. Command acknowledged and told her to hold. It was going to be an anxious, heart-pounding wait, dreading that enemies might suddenly follow them into the building, and dreading going out to attack them from behind when the signal came. Although they could speak silently among themselves, nobody said anything.

This wasn't quite what he'd imagined they'd end up doing, back when he and Brig joined the KOJ, Josh decided. Somehow he never expected soldiering, like being in the army. Yet here they both were, hup-two-threeing their way through Phoenix on a hot spring day as part of a KOJ battalion.

Chasing down heretics was okay with him, and for sure somebody needed to be doing it, but this whole bit about being a grunt in the Federation army wasn't exactly what he joined the Order for. Joshua had imagined something more along the lines of being a spy or a secret agent, than an ordinary trooper. He knew that his friend Brigham, marching right next to him carrying a machine gun, felt pretty much the same about it.

A lot of things hadn't turned out the way they'd thought. Back in early March, it was supposed to be all over. Yet today was April 15th and here they were in hot pursuit of enemies they didn't even have a month ago. Reverend Cleary and the other Order leaders were careful to keep their own people in special regiments separate from the Federation's men, but since they functioned in the field under joint command, on a practical level there was little difference. They got issued with the same weapons and equipment, received the same training, pulled the same duties. All that

onward Christian soldiers stuff wasn't just metaphor anymore. Still, what could you do? It wasn't like a guy could desert. You could get away from the army, maybe, but how could you run away from God? And who would kill these effing Sing heretics if they didn't do it?

Shooting heretics, sending them on to their rewards (which he trusted would be hot), now that was something they could get into. The trouble was, these bastards kept disappearing on them for a while, then opening up on them from long range, then running away again like cowards. Lather, rinse, and repeat.

Brig was scanning the sides of the street ahead for any telltale shimmers or suddenly firing snipers. He was totally keyed up. They'd already lost two men, but that was earlier on when the exchange of gunfire had been at closer range. A part of Josh which he didn't want to examine too closely was relieved that the enemy were cowards who were too scared to get in range to penetrate their body armor with a direct shot. These weird vibrations that he could feel through the soles of his boots every few seconds, and that seemed to hum in his skull behind his eyes, were also rather unnerving. But that had been going on for a while now, and they'd all begun to tune it out.

The lieutenant was shouting orders. They were to move out onto this golf course and hit a main body of enemy troops. Enemy troops? What the hell, these Sing guys had an army? Suddenly, Josh realized that a lot of separate Federation contingents were meeting up at this one end of the golf course, coming together like a confluence of rivers. Shit, they must have better than ten thousand guys here now. Brig grinned at him, and Josh gave him a thumbs-up sign back. They were gonna kick some *ass* now! Then maybe all this would be over for a spell.

There were these floating platform doohickeys over there, that looked like those old pontoon barges people used to put out on lakes that you could swim out to, except these were way up in the air. He figured they must be for some kind of protection, and the enemy must be hiding beneath them.

Sure enough, as soon as all their guys arrived and formed up, they started heading that way. Josh checked his weapon and adjusted his belt as they jogged along, swiping a swallow out of his canteen too. Damn but it was hot out here, and this was April? He would never understand why people wanted to live in a freaking desert.

What was left of greens and fairways, that the desert had not taken back, was soon destroyed by thousands of marching booted feet. They could see the enemy now, it looked like a couple thousand of them, just standing there waiting, all in their white. On an almost subconscious level, it bothered Josh that the enemy always dressed in white. White was supposed to be for the good guys.

A kind of breathless enthusiasm spread invisibly from man to man as the enemy continued to just stand there passively as they approached. Without the need for further orders, they began to charge, picking up the pace and shouting, bellowing, then screaming wordlessly at the mustered vigilantes. The men fanned out, with a yard or two spread around each man, so that they wouldn't be so much in one another's line of fire.

Brig and Josh were in one of the forward companies, but not at the very front, so when the men ahead of them stopped running and started walking forward firing, they were able to see clearly what range they'd need to achieve. In a fight like this, one infantry formation against another, only the soldiers in the front line of each force could use full auto safely without hitting their own men. The ones behind had to use single shots only and aim between or over their fellows. With their color-coded scope sights, that wasn't as hard as it sounded, nor as error prone. If Josh's weapon was pointing at a friendly target, his viewfinder glowed red, went white if he had no target, and turned green the instant he was sighted on a bona fide hostile. He picked out a Sing near the front and squeezed off a couple of shots when he saw the crosshairs flash green.

Nothing! He'd swear he must have hit him, but the dude just stood there swaying, calmly firing back. Their body armor couldn't be that good at this

range, not against the piercing hollowpoints he was using. Hell, it looked more like spandex than armor anyway. All the Sing dudes looked like they were dancing or something, leaning this way and that, bending and ducking and flexing in what looked like random ways, sometimes sharply in a blur but mostly pretty casual. They couldn't possibly be dodging bullets, could they? In any case, the guys in the enemy front ranks weren't falling – but plenty of their own front line men were. Some were obviously hit, while others were just hitting the deck and getting down to fire from a safer prone position.

Brig suddenly looked up and gasped, and Josh looked up in the air and saw it too. A whole pack of remote-controlled Federation drones were flying like a swarm over the Sing positions. They started dropping ordinance. That was gonna hurt. Which must explain why their charge had stopped well short of point-blank range.

Josh had also wondered why they weren't charging around to flank the enemy and surround them, since they had so many men here, and now he saw the answer to that, too. Two more large bodies of Federation troops were rushing the Sings from both sides, at least five thousand more troops per side. And holy hell, the ones on the right side had an armor brigade with them. Man, those tanks could move! It was hard to believe that something that big could tool along that quickly. Those tanks were gonna slice right into the enemy formation, guns blazing. This was gonna be a massacre. Josh almost felt sorry for those poor bastards. He resumed firing, squeezing his trigger every time his sight gave him a green flash.

Right on schedule, Clay thought, amused. He couldn't have worked out this timing any better if he was giving the enemy their orders himself. The Federation infantry was split into three groups, attacking simultaneously from south, east, and west. The southern force was over twice as large as the other two, with the armored vehicles on the east side. Enemy bomber

drones were now hitting them from above.

Clay threw a switch that triggered their signal jamming equipment. Now that the enemy commanders had managed to get their forces here in such a beautifully coordinated fashion, there was no longer any reason to allow them to communicate with their men.

The Cyberantes' own drones could easily have taken out the Federation's remote-controlled fliers, but doing that too soon might have made them reluctant to attempt a headlong charge without air support. The microburst generators on the overhead platforms shunted aside every piece of ordinance the drones dropped. The bombs bounced away in random directions, but since there were enemy troopers covering the ground on three sides of them, it was inevitable that the majority of the resulting explosions rained down death on Federation forces rather than their intended targets. With their remote control communications links jammed, the bomber drones shifted to onboard AI piloting, and in the absence of new orders to the contrary, dutifully continued making passes at their last designated targets. As wave after wave of falling bombs caromed into the Federation ranks, the Federation troopers hit the deck, ran in circles, or fled in terror, only to be hemmed in by their own men still streaming in behind them. Some of them even started shooting up at their own drones, desperately trying to disable them.

Cyberantes commandos on the east flank lobbed a swarm of sawbots from their utility belts at the incoming tanks, programmed to slice through their treads, then remove their guns. In about ten seconds the armored vehicles were all immobilized and helpless. Only one tank actually reached their perimeter before it lurched and skidded to a halt in a cloud of sand.

It was time for the next phase, so Clay tripped another control which summoned their own dragonfly drones, still patrolling nearby, to take out the enemy bombers. As soon as that task was completed, he gave his next order. The third of the Cyberantes forces that were mounted on air bikes, who had been clustered on the north side and screened by their fellows,

now rose into the air. Fanning out over the enemy forces, they sprayed them with high-caliber automatic weapons fire from about fifty feet up. At that close range, Federation body armor was all but useless. The carnage was dreadful.

Inevitably, the enemy began to break ranks and flee in all directions, desperate to run out from under all the death falling from above, pelting toward the nearest houses, longing to get clear of the golf course, which had become a killing field. Abruptly, the flying bikes ceased firing, as Clay issued another set of orders. The Federation troops, however, did not stop running.

Not until the Cyberantes troops unstealthed right in front of them, thousands more of them who had drawn a ring around the golf course on all sides, standing there in their white with weapons leveled, blocking every possible exit.

“Throw down your weapons!” a stentorian voice boomed over the battlefield. “Surrender and you will not be harmed!” The only reaction which prevailed was confusion. Some few did as they were bidden. Some stood, still clutching their weapons, unsure what to do. Some veered and tried to run a different way, then ended up jogging in circles as they empirically verified that every escape route was indeed blocked off. Still others decided to engage the encircling Sings, struggling to fight their way out.

The Cyberantes had unstealthed at a range where their superior weapons and body armor gave them a crippling advantage, and they were taking no chances. They opened up on any Feds who threatened to get too close, driving them back. But in a few places, knots of determined troopers managed to break containment. The fliers pursued these, gunning them down from behind as they ran.

At length an unspoken consensus was reached among the Federation survivors, and giving up suddenly became the prevailing opinion. As more and more surrendered, the Cyberantes began to tighten their circle, while

their forces in the center around Clay's command post spread out to offer additional surrender incentive in the form of guns pointed at the survivors from behind.

Clay signaled for medical teams to move out and start treating the wounded. It was all over but the crying.

He'd never in his life felt rage like this. It was as if some part of him believed that if he denied reality hard enough, he could force his way back in time somehow and undo what had just happened. Roger Sarner's hands shook and his breath rasped harshly in his throat. They had been sucked into a trap, and they'd fallen for it totally. The vigilante teams they'd been chasing, which were so like what they'd experienced before, had fled like evanescent ghosts right toward their main force. Every time they'd appeared, fired, and fled again, they'd been conditioning the Federation forces to believe that they would win if only they could ever close with the elusive ghosts.

He could see it now, in his mind's eye. There were a lot more ghosts than they had realized. Thousands more. And they'd crept up behind, ready to ambush and trap their men. Why hadn't he and Nelsen realized, given their stealth capabilities, that the enemy they could see might not be all the enemy that there was?

And that sudden loss of communications. Why hadn't the total absence of any jamming attempts suggested to them that the Sings simply hadn't tried it yet? And when the Sings took out their fighter cover as easy as pie, why didn't they get suspicious when nothing whatsoever happened to their bomber drones?

It was now clear to Sarner that the Sings had way more numbers, and much better technology, than the Federation had anticipated. Which was disturbing, but that wasn't the worst of it.

The worst of it was the realization that they'd been played, big time.

That *he'd* been played. That somebody knew how the Federation leaders thought, and had been able to grease the skids for them so they'd make every mistake possible. Sure, their troops had been outclassed and outfought. But worst of all, they'd been out thought.

Even when he was a kid, Sarner hated losing. He'd always demanded a do-over anytime he felt he'd made a really stupid mistake. He wanted to do this battle over so badly he quaked with it. His thoughts spun around in his head like a fever dream, watching it all spiral out of control, denying, wanting it to go different, back to watching his men being slaughtered, no, no! Go back and do it again, this can't be right. The end result was a kind of numbness that imprisoned his thoughts so that he could scarcely do anything. It took a major effort even to speak. He'd never been so angry that he couldn't even lash out at somebody.

General Nelsen sat next to him at the table, equally subdued, as their command tank raced through the streets of Phoenix at nearly its top velocity, desperately trying to get back to the west edge of town where their air transports waited, so they could return to headquarters. There was no guarantee that they'd get there, of course. This vehicle seemed like no protection whatsoever anymore. Sarner had watched on the view screen, almost disbelieving, as some kind of belt grenade things took out tanks in seconds. And those drones knocked out combat aircraft just as quick. When they'd set off driving at top speed, everyone had been expecting something to stop them almost immediately.

Nothing did, which in a way only made Sarner feel worse. It suggested they were escaping only because the enemy permitted it. Somewhere out there, some motherfucking Sing bastard was laughing at him, because he, Roger Sarner, had fucked up so badly. And was happy he was getting away because that meant he would continue in charge of the Federation and could doubtless be counted on to fuck up again. Which made every rocking lurch of this tank on its suspension feel like an insult.

Sarner absolutely *hated* being responsible for anything that went wrong.

And while it looked now like he was going to escape from the battle, he couldn't escape from that.

Salma gave Clay a firm hug as he stepped off his hovering command scooter. This had gone well today, but they were both relieved that it was over. Neither of them had any love of killing or of giving orders that were going to get other people made dead.

Clay looked over the bloody, still bodies that lay strewn in droves over acres of prime land that had once served for innocent recreation. He shook his head. "I wish to God these assholes would just leave us alone," he said in a low voice.

Salma took his hand. "You did really well today. We only suffered some two dozen casualties, plus another fifty or so wounded. One of the wounded was in my team."

Clay nodded. "I know, and better them than us and all that, but I'm afraid I still can't be proud of what we had to do here today."

Salma peeled off her mask, then his, and gave him a fervent kiss. "I wouldn't want you to be proud of it," she whispered. "You're a good man, Clay Thorsten."

It no longer troubled him that the woman now in his arms didn't look all that much like the Salma Rivera he knew so well. So she had opted for a bit more of a makeover with her virtual self than he had done. So what? Like everyone, he'd heard the adage that beauty was only skin deep. But there was also a kind of corollary to that, that real inner beauty came out in any form. After what they'd done together, here in real space, he knew that their bond of love would deepen into an ever more profound and satisfying partnership. And he no longer doubted that she felt the same.

Things were blinking at the edges of Clay's vision, probably because other people had discovered that he was no longer responding to messages sent to his external command console. There were a thousand loose ends to

tie up. He took Salma's hand and started walking toward his responsibilities. But in a strange way, he felt that he'd been through a kind of purging or tempering fire. He no longer thought of this world as the future, or even as the most important world. He wanted better worlds. And he knew that together he and Salma would find them, or make them.

Joshua sat on a stool next to Brig's pallet in the makeshift hospital. Brig wasn't too bad off, just took a bullet in his left shoulder, but his face looked a little strained as he slept, the pain not quite breaking through the mild tranquilizer he'd been given. Josh himself was miraculously unscathed. All that destruction falling from the sky like the wrath of God, diving into craters that weren't there a second ago, rolling over dead men and severed limbs, and yet the worst thing that had happened to him was to discover when he came to that his last meal was satcheled in his uniform trousers. God sure must love him, when so many others hadn't been so lucky.

He'd found Brigham nearby, bleeding and dazed, but alive. Those Sing heretics made them disarm and take off their helmets, but after that they were actually surprisingly nice, offering them food, water, and medical attention without any evidence of rancor. Josh had never been in a battle before (and sincerely hoped he never was again) but he'd always figured that forgive and forget didn't set in till a long time afterwards. And if these Sings were really the spawn of Satan, why were they being so considerate in the first place? It was like as soon as the shooting stopped, they were ready to make up and be friends. Which was weirder than hell because they were all acting pretty much like Jesus would have wanted them to.

Brig had been offered some Sing nanobots which the doc – this little chick who was actually really cute – said would patch him up from the inside in nothing flat. But he'd refused, citing religious objections, and she'd shrugged, removed the bullet, bandaged him up, and given him some plain antibiotics and the sedative instead. Josh had expected the lady doc to

laugh and inject Brig with the medical bots anyhow, instead of respecting his wishes.

Now Josh was sorely confused. Nothing ever happened that wasn't the will of God, and that was a fact. So what were they supposed to do now? He looked at Brig and watched his chest rise and fall softly, and couldn't figure out why the two of them were still alive when so many others weren't. *Did you save us for some special reason, Lord?* he wondered at the ceiling. Joshua gave it a think, but he just couldn't figure out what the reason might be.

A lie can travel around the world before the truth can put its boots on.
-- [Mark Twain](#) (1835 - 1910)

Chapter 34
Memory Leak

Bright neon signage contrasted starkly with dark walls and polished black floors, glittering with myriad reflections. Black light flared on painted signs, on posters, and on the clothing of the seething mass of patrons. A soundscape as garish and diverse as the lighting assaulted the ears. Torch made his way carefully around the arcade, keeping to the middle of the two-way traffic stream, away from the numerous barkers and hustlers positioned in front of businesses of unusual, and frequently dubious, character. If the Mall of the Western Hemisphere constituted a hub of demure, respectable commerce, the Dark Palace served the wants of the flip side. If the Mall was a staid white market, the Palace was an exotic black one, where absolutely anything and everything was for sale.

Based on the appearance of the people packing the concentric rings of its endless arcade, which went on level after level and mile after mile, Torch would have guessed that it lay in Thailand, or perhaps some other southeast Asian country. There were also Africans, Latins, westerners like himself, and even some middle-easterners among the patrons, creating a mixture as diverse as the vegetables in one of those eclectic Thai curries. In fact it was not unknown to see avatars here which did not appear human at all; that lycanthrope walking into an ecstasy shop, for example.

Actually of course the Dark Palace existed only in virtuality, just as the Mall did. Torch found that the atmosphere of the Palace became oppressive after a while. The sea of alien humanity forced him to confront the uncomfortable reality that the cultural values of his own background held little sway among the great mass of people on the planet. The cyberverses reflected the wants and needs of those who populated it; and these days, the majority of those residents were non-western. It pained him

to think, for example, how few Believers probably surrounded him in this place.

The markings winking on a pillar at an intersection showed him that he was drawing near to his destination. He was on the correct level now, and less than fifteen degrees of arc away around the vast rink. The 3D polar coordinate system used in the Palace took some getting used to. The section he was now walking through was largely given over to gambling establishments.

Contemporary bettors seldom wagered on anything as simplistic as cards or dice anymore. The fact that *everyone* could count cards and compute favorable odds in their heads took all the fun out of simple games of chance, by dint of harmonizing the bets laid. So bets were taken on the outcome of more complex circumstances, possessing a high degree of variance and randomness. One could lay bets on the occurrence of events in thousands of virtualities where outcomes were determined by the interactions among participants sometimes numbering in the millions, or on events in real reality, or even on such trivia as when a particular atom in a certain radioactive isotope sample was going to decay, a game known as Heisenberg roulette.

Many of the circumstances on which one could lay bets correlated with some economic outcome, such as the success or failure of a company or a new invention, or the likelihood of a particular loan being paid back. With the ubiquity of what were called predictive markets, the boundary between speculation and gambling had blurred almost beyond recognition. Casinos sometimes sold bonds, while brokerages took wagers, writing underlying contracts on the fly where necessary. The augmented pattern recognition and statistical computation abilities of the general population made everyone and his Paia into a potential market guru.

The trouble was that everyone else had the same capabilities, which tended to create a regression series of derivative bets based on other bets. Inevitably, complexity and unpredictability were leveraged to a point where

even super-intelligences employing comprehensive statistical models could no longer reliably predict the outcome, and so there the betting stopped.

Supposedly, it all made the allocation of capital that much more efficient. Which was important, since electronic money could no longer be created out of thin air and the amount of available capital was therefore finite, drawn from savings rather than from borrowing. Markets could now react in minutes to altered circumstances that might have required months or even years to accommodate in the past. But for the most part, it all made Torch's head spin. He didn't believe in gambling, and as a rule investing scared him because a lot of the time he could barely tell the difference.

An odds board in a bookie establishment which he was passing advertised that the North American Federation now stood at 763.85 to 1 to defeat the Cyberantes. He scowled, annoyed.

His destination was now in sight: a cambio boutique which exchanged among various cyberverses currencies. They also featured a coffee shop which served a fabulous cup of chai. He had not been here since late last autumn. The boutique looked unchanged. Likewise his purpose.

Torch had once come here to meet a man, an important contact, the same dude who'd given him the High Sing cryptokey which had transported him and his friends to the New York simulation. Torch had never heard from him again, until just yesterday, when the man had suddenly requested this urgent meeting.

Torch found his man seated at the coffee bar, a few stools apart from any other patrons. He sat down next to him and offered him a quick nod.

Taylor McGivens jerked his head at Torch in return, and took another pull from his mug. He was imbibing some kind of chai, but spiked with something pretty potent which teased Torch's nostrils from several feet away. McGivens appeared much as Torch had seen him last: rather nondescript in jeans and worn leather jacket, scruffy short beard and mustache, longish brown hair, with a slightly dissipated look. Torch had concluded the first time they met that it was a calculated pose, and today's

second look only reinforced that opinion. McGivens was obviously someone important who wanted to pretend that he wasn't.

Torch got some hot chai of his own (unspiked) and looked pointedly at McGivens, waiting for him to take the initiative. He had, after all, requested this meeting.

"Mr. Torch, the people I work for don't much like violence." The Scottish burr in his speech was slight. Torch wasn't sure how to take this comment. A warning, a threat, a rationalization?

"And?" he asked neutrally.

"And so, they're looking for another solution, y' see. One where no one else gets hurt. In real life, I mean."

"Well, I'm all for that," replied Torch. "How can I help?"

McGivens took another pull, set his mug down. "You can pass on some information, is what." He paused. "Very important information, very special."

"And very secret, no doubt. You know Taylor, I have to ask myself, why are Mr. McGivens' employers so eager to tell me secrets?"

McGivens turned to face him and smirked in a friendly way. "I expect because they want the secrets t' reach those you're going to share 'em with."

"Really. And who is that?"

"Well. I expect we could start with your father, Daniel."

Torch froze, his gaze fixed on Taylor McGivens. His avatar's heart pounded. This man obviously worked for the Sings. If they knew who he was, had he been lured here so they could kill him? But no, that was impossible. Lethal weapons didn't function in the Dark Palace except in dueling grounds, and only when both parties agreed to their use. And even then, they could only inflict pain, not kill his real meatspace body.

"No, Torch, I'm not going to challenge ye to a duel," McGivens continued, eyes sparkling with amusement.

"But you work for—"

"The enemy, in one word. Yes, I do. But what you need to understand is that th' other side isn't monolithic. Not everybody agrees, or sees things the same way. Now that battle in Phoenix two days back, there are some who helped make that happen, and were a-cheerin' for it. But there were also some who were appalled by it."

"Because of the violence."

"That's right. An' you and I both know, there's gonna be a whole lot more of it, if some better way's not found of settlin' everybody's differences."

Torch found it hard to believe that there were any Full Sings who were anything other than ecstatic about how that dust-up in Phoenix had turned out. That wasn't a battle; it was a massacre. But being more than a little appalled at all the violence himself, he was at least willing to listen.

"I'd agree with that. So what's the better way?"

"Well that's the information I'm t' give you, and you can all do with it as you like."

"Okay, shoot then." Torch sipped his chai and looked away disinterestedly.

"You've probably heard that the cyberverses are decentralized," McGivens began.

"That's not exactly news, Taylor. Our whole problem with it is that it's so decentralized."

McGivens shrugged. "But have ye ever wondered how it really works? I mean, how does something so completely decentralized always know where to go, even how to route around damage, as your lot discovered a while back? What if I told you that that was all a lie, just a convenient bit of propaganda?"

Torch shot a look at him. "I'd answer that it's a pretty damn convincing bit of propaganda, because it tallies with everything we've ever observed about it."

"And that's what they want you t' think, lad. That's what they want

everyone t' think. But the fact is mate, that the cyberverses works because there's a central registry of nodes. When a node comes online, it broadcasts about itself, and that broadcast is picked up and fed back into the master registry. You can find an' access any virtuality in the cyberverses because what the system is really doing is quietly accessing that registry. It's all set up so that th' leaf nodes don't know about other leaves that aren't on their branch, but in the end the only reason the leaves are all together on the same tree is because their branches are all connected t' the same trunk."

Torch digested this for a moment. It sounded superficially plausible, but he didn't see yet just how this was helpful. It was an interesting theory, that was all.

"Interesting theory. But how does it help us?"

"I would ha' thought that was obvious. You have the Master Node List, you know where everything is. You could find the hardware hosting where we are right now. You could find anything."

Torch was thunderstruck. What a weapon, if this were true! He looked directly at McGivens now, trying to form an estimate of his veracity. "I guess that begs for the question: who controls the central registry?"

McGivens nodded slowly. "That is indeed th' question. The answer is that Justin Turrell wrote the code a long time ago. The DR.OS Protocols. An' so everybody, all the Full Sings, they're all beholden to him. He holds the keys to everyone's information. Because only he, or those he deputizes, have access to the registry. The ultimate control is his, because he built the system."

Torch frowned. "I thought Turrell always enjoyed a good reputation among the Sings."

"O' course! And so he did. The man who sparked the growth of virtuality by making it all possible. The first real, true, Full Sing, the first t' become a completely artificial intelligence. Without a body. He got others t' do it too, and recruited thousands of allies that way. But he's always been the one more equal than others. And what's going on now, it's completely

terrifying.”

“What's going on now?”

“Why, this Last Trumpet business. Hundreds o' thousands now, and they're all pure AIs, but they're not people gave up their bodies, they're dead people who shouldn't even be alive. And they're all Turrell's followers. He couldn't get th' whole human race to roll over and become like him, so now he's creating his own race of AIs by scanning the dead. And they'll all live in his cyber-system, with him controlling the registry. Pretty soon there'll be so many of 'em that the rest of us won't matter. Don't you see how that makes him the next thing t' God?”

Torch had to admit that this line of thinking jibed with what his old man thought, not about Justin Turrell specifically, but about the Full Sings in general. “And so what you're telling me is that some of the other Full Sings are disturbed by this plan?”

“Aye, that's what I'm tellin' ye. And the Moshes, they should be even more disturbed. You see, once you go the Full Sing route, ye can't come back. And so Justin wants everyone to have t' become like him. That means either they convert themselves over, or they get killed and scanned. But y' see, he can't just wipe out all the Moshes in a bloodbath. He needs a pretext to justify th' killing. Needs a civil war in meatspace, which will go on till everyone's dead. Then they all res up into his virtual universe, and he'll have everybody living his way in his bailiwick.”

Torch found this narrative almost sickeningly disturbing. He took a long bracing drink from his cooling cup of chai. It all made a kind of sense, especially when he thought about what the Cyberantes were ostensibly doing.

“I can see in your face that I've struck a chord in ye.”

Torch nodded reluctantly. “I was just thinking about what some of my Sing friends are doing.”

“Meaning your friends Clay and Salma, who founded the IADC, thinkin' they were defending the cybervers from th' Moshes. An' you know who

Clay works for, don't you?"

"Yes. Stefan."

"Th' same man, a friend o' Justin's, who invented the Cronus Scanner. Didn't Stefan promise to raise up anybody who died in the fightin'?"

"He did. I was there."

"An' now you know *why* he did."

Torch fell silent, considering.

"I wouldn't blame your friends," McGivens continued after a while.

Torch shook his head. "Oh, I don't. They think they're doing right." There was still something he had to know, to complete the picture forming in his mind. "So I take it your employers don't like what's been revealed to them of Turrell's megalomania, and they want to stop his plan before it's too late."

"That's righ'."

"So why give us this information? Where do we much-despised Moshes fit?"

McGivens looked at him steadily and spoke very softly. "Because you're free to go into the cyberverspace to find th' Master Node List."

"But why can't your bosses do that? Surely they'd be a lot better suited for it."

"Ordinarily, you'd be right. But think about it. If Justin catches somebody lookin' for the List, and that somebody is a Full Sing running on a computer, he could just shut down that system for good, and prob'ly even blame your dad's lot for it. But you people who still have bodies, he can't shut those down."

Torch raised his eyebrows. It seemed a curious twist of fate that there was still something a Mosh could do that even a Full Sing couldn't. But it made sense. As long as there were bio-Sings out there who could jack into the cyberverspace, Justin would be vulnerable if anybody ever found his List. But there was still one aspect that didn't make sense.

"If my dad and Roger Sarner ever get hold of this registry List, you know

what they'll do with it.”

“Aye.”

“So why aren't your employers worried about that?”

Eyes twinkling, McGivens explained: “Because we're building a new generation of computers that won't be part of the DR.OS network. Only, we can't deploy 'em yet without tipping our hand.”

Torch was sold, but he knew his father might not be. “But that means—”

“That you'd never be able t' destroy the whole cyberverses. There'd still be a part you couldn't touch. Quite true. We're not prepared to let you destroy our part of it. But you're welcome t' destroy Justin's portion. Which is everything that exists now. After that, we don't have any ambitions. We're willing to let the Moshes live biological, as human beings were meant to live. Those of us who aren't human anymore will continue t' survive in our own fashion. We don't want to run th' world, or bring everyone else into ours.”

Torch considered his options for only a moment. “All right. I'll take this message for you. But even if our leadership goes for it, we wouldn't know the first place to start looking for this List.”

“Of course ye wouldn't. Justin's countin' on that. But we're working on it. You decide you want t' go after it, you let me know and you'll have some help.”

“Fine. Thank you, Mr. McGivens.”

“My pleasure, Mr. Torch.”

Torch shook Taylor's hand, tossed off what was left of his chai, and stalked into the cambio side of the establishment, striving to conceal the elation that he felt. He was brought up short by the exchange rate posted on the board for ameros. The NAF currency had lost ninety percent of its value versus all of the metals-based units since he last tried to exchange some, a couple of weeks ago.

“Excuse me, that Amero to Aurumnet rate can't be right,” he said to the attendant, who like almost all retail clerks was clearly a NPC.

“The posted rate is correct, sir,” the attendant replied crisply. “There has been a recent coup in the Federation, and the new leadership is borrowing money into circulation like there was no tomorrow. They have also abandoned the charitable projects which elicit the donations that are the government's major source of revenue, making it likely that the currency will soon lose all value. If you have any ameros, I would highly recommend that you exchange them while there is still a speculative market for them, sir.”

“Oh, all right, I'll take it then,” Torch said reluctantly. Damn, this was inconvenient. He surrendered his banking datapad, having authorized it for almost his entire account balance. As the attendant gave it back to him along with a wallet filled with freshly minted Aurumnet digital coins, he reflected glumly that he was going to have to watch expenses carefully from now on. Unlike his girlfriend, he had no regular source of income within the cyberverses.

As he left the boutique for the glowing, ever-crowded hallways outside, he reflected that the good news was that achieving the quest for the Master Node List could also win him his girl. Cylara insisted she wanted them to be together only in the cyberverses. But if it got destroyed, would she settle for a life together in reality? Torch was willing to bet that she would.

He wondered idly whether he could find a bookie on this street who'd take that bet. As he hastened along the concourse toward the nearest Dark Palace exit zone point, he found himself much less bothered by his surroundings. He knew now that there was a chance all of this would go up in smoke someday soon. Knowing that, he could feel set apart from the human flood around him, those for whom the end of all this glamorous wickedness never entered their darkest dream. If it was all temporary, it need not distress him so much.

Torch zoned out of the Palace without regret, bent on completing just a few more errands in virtuality while he was still jacked in. Then he would head straight to a face-to-face meeting with his father. It seemed their

prayers had at last been answered.

Taylor McGivens rose from his stool and ambled down the concourse toward the nearest zone point. He'd performed a lot of odd jobs for his employer recently. He'd noticed that that weird installation he'd done in Labrador had gotten bombed out on 3/3, and put it together that it was somehow because of that kid back in the cambio. In which case, all that blither he'd just fed the kid had to be intended to get the Moshes to do something. What, he didn't know. But he was sure Petrov had some kind of a scheme whose every move had been foreseen. Petrov was like that, and Taylor was pretty sure he'd find it downright amusing, when in due course he got to hear how it all turned out.

The only way of discovering the limits of the possible is to venture a little way past them into the impossible.

-- Clarke's Second Law, [Arthur C. Clarke](#), "Profiles of the Future" (1962)

Chapter 35

Out of This World

The sun blazed down on the orbiting platform, slanting in at a sharp angle. Only recently had it cleared the curve of the Earth's horizon. The portion of the planet below that lay west of the terminator – the waist of South America – was still in shadow. Tinted glass took the place of atmosphere in moderating the flood of solar energy that poured into the control chamber, but the dawn was still gloriously bright. Outside the panoramic windows, a streamlined but squat shape waited on a flat metal launching pad, like a motionless platinum bird with its wings folded.

Professor Sky carefully monitored the readings on a complex holographic instrument panel. Members of her research team clustered around her or studied their own consoles. Justin and Riksana sat among the small company of spectators, beneath one of the huge space-backed windows. A portable holodisplay hovered in front of them, passively replicating some of the systems instrument data feeds. In view at the moment was a glowing white sphere, which appeared to be levitating at the center of a minor electrical storm, like something out of a crude Tesla demonstration. Numbers streamed by beneath the image, at thousands of digits per second. Riksana read the numbers, which were raw telemetry data, fed them into a matrix of governing equations, and solved the matrix in her head, updating it in real time as the data flowed by.

"The wormhole mouth is certainly stable," she murmured after several minutes.

Justin sighed. "Of course it is, love," he said tolerantly. "Starry would hardly be going ahead with the countdown if it weren't."

"Well, I don't know enough about the engineering of the photonic stardrive to check up on the readiness of *that*," Riksana laughed.

The holographic rendering of the electrified sphere depicted the state of an actual object which was aboard the *Thorne*, the spacefaring vessel being readied for launch outside the window. The sphere was an energized superconductor which served to prop open one end of a stabilized wormhole. An identical sphere, which held open the opposite end, was located only a few dozen meters away in a chamber elsewhere on the orbiting launch platform. The wormhole created between them had been expanded from its original subatomic size to a width of nearly a nanometer. The spheres expended energy to maintain and stabilize the wormhole, at a rate that would remain constant regardless of how distantly separated the two endpoints might become.

In truth they were going to end up very far apart indeed. As soon as Professor Sky and her team completed their preflight checks, the *Thorne* would be on its way to the Rigil Kentaurus system, more colloquially known by its Bayer designation, Alpha Centauri. By emitting a continuous stream of high-energy photons, the ship's engine would gradually accelerate the ship to a speed very nearly approaching that of light. Although Centauri was 4.37 light-years from Earth, the journey would take only ten weeks, ship time. Because the stretched wormhole would maintain a coterminous link between the temporal reference frames of its two endpoints, it would become possible to transmit data instantly between Earth and the *Thorne* in the Centauri system only ten weeks from now.

In addition to the stabilized wormhole mouth, the *Thorne* carried a complement of exploration nanobots. Networked to the ship's onboard AI, the nanobots were capable of erecting and replicating molecular structures on any suitable planetoid or asteroid within the system. The remote scans of the system indicated that there were at least two stable, terrestrial planets orbiting Alpha Centauri, with at least one more such rocky object orbiting nearby Beta Centauri. Spectrographic analysis showed that necessary elemental raw materials would be abundant. Initially, the nanobot swarm would fabricate molecular circuitry and solar cells. That,

plus the instantaneous transmission capabilities of the wormhole, would give Sing culture a foothold in the system.

The imagination of human scientists and writers and futurists had long been captivated by the possibility of discovering Earth-like planets which the human race could colonize. But in the event, by the time human technology actually launched the first interstellar space probe – in a few minutes hence – the requirement that the destination astral bodies must be class M planets capable of supporting life, no longer existed.

Justin couldn't help but find the irony amusing. This control room was, of course, an exact simulation of the orbital launch station, a virtual world linked in real time to sensors and control interfaces physically resident on the actual station above the Earth in real space. Someday soon, if all went well, an analogous simulation would allow him (and anyone else who desired to do so) to experience being on Alpha Centauri II in real time.

Riksana continued to monitor the various data feeds being emitted by the *Thorne* and its launch control systems. She was not, however, oblivious to her companion's mood. "You seem very thoughtful."

"I was just reflecting that the American Revolution began on this day."

"This day?"

"April the 19th, 270 years ago."

"Ah yes. Which makes the *Thorne's* nanobots what, the herd shot round the world?" she quipped.

Justin had to smile. "Some people think you're without a sense of humor. But I know better. I think you're only humorless when you try to joke."

"Ooh. Tough crowd." She flicked him an amused glance. "Looks like the stardrive's preflights are all completed."

Sure enough, Professor Sky was settling back in her chair, expressing satisfaction. Then she rose and faced the small audience, who accorded her their full attention.

"More than seventy-five years ago," she began, "Neil Armstrong said that the first footstep on the moon was a small step for a man, but a giant leap

for mankind. Today we continue that tradition by making another giant leap, this time across interstellar space. Completing this leap will allow human culture to begin its expansion across the physical universe. On behalf of the Centauri Foundation, I would like to thank all of you who have contributed to this effort, and given of your time, talents, and money to bring it to fruition. Your support has enabled us to cross the chasm between worlds.

“I am now going to set a two minute countdown, after which the *Thorne's* AI, named Kip, will be free to launch the ship. Please get yourselves into a good position to observe, and enjoy the show.” And with that she triggered the countdown, to a round of polite applause.

Justin and Riksana abandoned the telemetry displays and moved to stand, side by side, before one of the tall glass panels facing the ship. This was an important moment for them as well, because the *Thorne* also carried some very special software of theirs that would be put to use at the other end of the journey. A kind of experiment within the experiment.

Heightened abilities to process sensory inputs and ponder their meaning and significance tended to result in the extension of subjective time, so that events which in fact took only moments might be perceived as occurring in slow motion. Most of those present chose to savor the event by turning up the resolution on their perceptions.

Justin and Riksana, lightly sharing thoughts and impressions between them as they often did when together, saw the flare of the chemical rocket thrusters that maneuvered the *Thorne* off its launch pad and eased it to a safe distance away from the orbiting station. At that point, with the ship still resembling a vehicle rather than a point of light, Kip shifted the engines to ion emission mode. While the ship was traveling slowly and within the solar system, it would eject ionized plasma consisting of light atoms such as xenon, moving at speeds much less than that of light. Once it had cleared the gravity wells of both Earth and the Sun, the engines would be switched to stardrive mode, emitting streams of photons, almost massless particles

traveling at light-speed. The initiation of that flight mode would not be visible, of course. The same series of engine modalities would be used in reverse to decelerate and land the *Thorne* once it reached Centauri.

Under ion propulsion the ship quickly swung out of view, taking a parabolic course downward over the south pole and sheer away from the orbital plane of the solar system. Its silvery dot flicked like a shooting star as it disappeared.

“Bon voyage, Kip,” Starry Sky called after it.

“Thank you, Professor,” came the voice of the AI pilot over the audio link. “All systems nominal.” There was a round of heartfelt applause and then much hugging and shaking of hands all around.

When the social amenities had been duly observed, Justin and Riksana zoned back to her aerie. “Well, it's good to have the *Thorne* on its way,” she offered cheerfully. “Starry was kind enough to allot me an encrypted channel through the wormhole directly to Kip, so I'll be able to keep in touch with him and upload any software updates.”

“Nifty. Speaking of the software, I'm delighted to announce that I expect to have a light schedule for the next few days. It should take that long for our crazy Moshes to parse the information we've just leaked to them and decide to act on it. Would you like to crunch out some progress on the transformations?” He grinned at her.

“Ha! You should know better than to ask that. Let's get to work.”

My final reflection, I'm afraid, was that if hypocrisy can be said to be the homage vice pays to virtue, theology could be said to be a homage nonsense tries to pay to sense.
-- [James Gould Cozzens](#) (1903 - 1978)

Chapter 36
Providence Provides

Roger Sarner looked with approval at Daniel Cleary, who sat beside his father. So this was the young man who had garnered most of their intel from inside the cyberspace. That explained a lot, as far as the KOJ's latitude with hypocrisy was concerned. Sarner understood intuitively that there were always special rules for those at the top. Young Cleary was obviously permitted to play in the enemy camp because the Reverend could trust him implicitly.

But he approved a whole lot less of what both Clearys were suggesting they should do next.

"Are you telling me we have to infiltrate the cyberspace to find this Node List?"

"Exactly, sir," Daniel said. Another point in the young man's favor: he showed respect. "The data is stored somewhere in a virtual world," Daniel went on. "We don't yet know which one, but my sources tell me that it's almost certainly an older, longer established world. Probably one that's still popular too, so that it's in no danger of being shut down."

"That makes sense," Sarner admitted. Then he shook his head. This whole business about relying on cyberspace intel from some splinter group among the Full Sings rang alarm bells with him, big time. He was awful damn tired of getting outmaneuvered by non-biological intelligence, and his instincts told him this could be some kind of ploy. "I have to say we could wish for more reliable informants, though."

"They're the only ones we have," Maxwell Cleary said, sounding as if at bottom he agreed with Roger. "I don't like it either, but they do have a motive for helping us. We're safe from reprisals and they're not."

Sarner nodded. "I understood all that. But you know, this could all be

some kind of stall, a wild goose chase aimed at keeping us from doing something more effective.”

The elder Cleary looked at him through his glasses, eyes widening in soundless exposition of every follower they'd lost in their campaigns in meatspace. “Such as what, Roger?”

“I don't know,” he sighed. “I gotta admit, they have us pretty well tied up.” That was the understatement of the week. Since Phoenix five days ago, they could hardly make a move without some Cyberantes “response team” showing up. Everybody and his brother seemed to have subscribed to their protection racket service in the past few days. His teams couldn't kick in a door anywhere at all anymore without getting into trouble. Yesterday he'd had to give orders to stand down from any more computer equipment seek-and-destroy raids. The alternative would have been mutiny among their own squads. They just didn't want to go out anymore.

And honestly, who could blame them? Sarnier just couldn't get his mind around the fact that a bunch of cyber-anarchists had managed to muster, train, equip, and organize a volunteer force that could flat-out kick the asses of anything the legitimate authorities could put together. Hell, these guys could probably have slaughtered the whole US military back in the heyday of the empire. When combat aircraft and heavy armor could be taken out by reusable drone devices that soldiers could clip on their belts, well, what could you do, really?

Not to mention that it was impossible to close with a decentralized mobile guerrilla force even if you did have battlefield superiority. Or the fact that the enemy's electronic warfare capability was a generation beyond the Federation's. It was like they could just bend the laws of physics anytime they wanted. Their weapons and suits were better, and their troops were so augmented they were superhuman, like something out of a freaking comic book.

For the first time in modern history, the government's monopoly of force was no longer sufficient to overcome the resistance of its own citizenry.

Instead, dissident citizens held an advantage in lethal force capability over the government. Bereft of superior violence, government suddenly could enforce its will only by persuasion. And precious few of the public seemed disposed to listen anymore.

It made him sad. Centuries of dedicated service by the elites, carefully guiding and restraining all those mad human impulses, ages of standing in the way of chaos, preventing humanity from annihilating itself and its world in an orgy of greed and reckless gratification. And this was where that noble history led. Sarnar felt like he could almost see and hear the ghosts of his predecessors, of presidents and prosecutors, congressmen and kings, who gathered 'round to reproach him for his failures.

Yet there was this one desperate hope left. But was it real, or was it some kind of trick? The best Sarnar could figure, it almost didn't matter if it was. They were about out of options anyway.

“Roger, are you okay?” Cleary senior asked, sounding almost solicitous.

The Secretary sat up with a small start. “Yes, of course. I'm just tired.” He rubbed his eyes in a show of weariness that was only slightly exaggerated.

“Do I take it you approve the operation then, sir?” Daniel asked.

Sarnar made himself speak decisively. “Yes, certainly. What kind of resources will you need?”

The Clearys exchanged a glance. “As much as you can give me,” Daniel replied at once. “We have potentially hundreds of virtualities to search, and I'm the only member of the KOJ who's been fitted with virtual immersion gear.”

“I can probably round you up a few hundred of our people. Turns out quite a few of our employees, even our best agents, have been spending their off time in the damned cybervers. Still, they won't all follow you, not reliably. So I guess that means I'll be coming with you, to coordinate things.”

Maxwell raised his eyebrows at his counterpart, but Daniel took it in

stride, saying only: "Very good, sir."

"Which means I'm going to have to go get myself polluted with nanites," Sarner continued, with a disbelieving head shake and a frown. "Thank God it's temporary."

"Indeed, we should be thanking God," Reverend Cleary averred. "This opportunity is the Almighty's doing, beyond doubt. You see a potential trap, but I see the hand of divine providence. These dissident Sings think they're beyond God just as they're beyond flesh. But they're not. He is manipulating them, influencing them. Why else would they conspire with us to destroy their own cyberverses? They're the ones going to their undoing, not us Roger."

"Good must triumph over evil, eh?" Sarner asked, but for the first time, he really didn't feel like he was mocking. He badly needed to believe that they could still win. Not compromise, not negotiate, but win. If God could make that possible, he'd gladly praise God for the rest of his days. He'd always believed that only the weak and the hopeless needed to appeal to a higher power. But their current predicament was forcing him to reconsider.

"I know a clinic where we can get you what you need done," Daniel offered. "I've dealt with them before."

"We might be smart not to, ah, requisition their services," Sarner mused. "Will they take ameros?" he asked sardonically. If they did, they were about the last black market outfit that would. Following its military defeat, the Federation's currency had collapsed totally.

Daniel Cleary smiled. "Doesn't matter. I've got enough gold to cover it."

It was ironic: now the only people who had money were the tax rebels inside the cyberverses.

Roger Sarner stood up from the rude table where they'd been sitting. It moldered in a dusty, run-down warehouse, in an uninhabited part of Long Beach. They no longer dared meet in a government office or a KOJ lodge. It was too likely that the enemy might train the Cronus Scanner on such locations, in order to eavesdrop on their meeting after the fact. But they

could hardly scan everywhere at once, and there was no reason that this dump should draw any attention. It had clearly been several years since anyone had even been inside. Sarner was surprised the antique fluorescents overhead were still connected to an electrical source. He'd picked the locks to let them in, practicing some of his old special agent skills from back when.

There was a message there, or at least a metaphor. In cities all over the world, there were buildings like this, abandoned, no longer used for their original purpose, no longer useful at all. Still owned by somebody no doubt, somebody who probably couldn't care less anymore. Sarner had a sudden vision of one of those big motorized rolling file drawers holding land deeds by the thousand, situated in a forsaken building every bit as dusty and deserted as this one.

Desperation was making him maudlin. He needed to watch that. "It'll be a couple of weeks before we can get rolling on this, I'm afraid. We've just got too much to cope with right now for me to throw these kind of resources at it, let alone myself. I'll be in touch, Daniel. And Reverend, if you can see your way clear to letting some more of your brethren get fitted for cyberverspace access in the meantime, it'd be a big help. Safe travels, gentlemen."

Sarner solemnly shook hands with both men. Gratitude for allies in a time of great trouble had perforce blunted his haughty habitual dislike for religious individuals. Then he stumped out to his air car parked in the alley behind the building, where his faithful human pilot was waiting for him.

He who fights too long against dragons, becomes a dragon himself.
-- [Friedrich Nietzsche](#) (1844 - 1900)

Chapter 37
State of the Dark Art

The new nanobot neocortex was working perfectly. In fact, it was exhilarating how well it worked. Daniel could look at an object and just *know* how big it was, or how heavy, or what it was made of, or exactly how far away it was or how fast it was moving. His hearing was similarly acute, able to identify the nature, location, and relative motion of objects just by the sounds they made. And that was in real reality. In any virtuality his reflexes were now so blindingly fast that he could react faster than all but the best simulations could cope with.

For the first time, he had added a mesh interface to his kit. Any information he wanted to look up, he could access just by thinking about it. The clinic technician handed him a test page written in Old Kingdom Egyptian syllabic hieroglyphs, and he read it off the page at once. On the next page he correctly matched complex chemical formulas to their molecular diagrams. Story problems involving differential equations were obvious. He was able to fill in blanks asking for obscure economic statistics, such as steel production in Japan in 1930, or Belgian unemployment in 1983, or the 2000 census population of Passaic, New Jersey. Asked a question about the structure of Beethoven's Fifth Symphony, which he hadn't even heard in years, after perusing the musical score in his head for a moment it was apparent that the main theme of the second movement was, in fact, a major mode inversion of the motif from the first. My, that was clever of crazy old Ludwig. And Good Lord, Daniel didn't even know how to read musical notation! Or at least, not until a few seconds ago.

By the time he finished the manufacturer's standard set of test questions – achieving a perfect score – he was absolutely in awe of his new

capabilities. It was as if the entire sum of human knowledge was available to him. His subsidiary ability to process and manipulate the data he accessed was similarly superhuman. He felt like he could write a doctoral thesis in a completely unfamiliar field in a matter of minutes.

“This... is... amazing!” he got out, then suddenly felt almost ashamed at having uttered something so banal.

The clinician grinned back at him. “Isn't it sweet?” he agreed. “Revision 11.3 just came out this month. More than double the capability of 10.0, which was released just six months ago. You got the hottest rig on the planet in your head right now, dude. You can't be any smarter and still have a head,” he joked.

Daniel laughed with him. This was way cool. Of course it was troubling, too, but what troubled him most now wasn't the intellectual abilities, it was that anybody could seriously consider such gifts to be evil in and of themselves. That was like saying that being too well educated was bad.

It reminded him of what he'd always heard about sex growing up, that it was such a powerful force, like an addictive drug that could make people do immoral and hurtful things just to get it. But when he actually got there and experienced sexuality, he always found it joyous and pleasant, not guilty or demeaning. It was certainly that way with Cylara. God, she was hot! They could do it for hours.

It seemed that, once again, he'd been lied to. Everyone knew that if you got high-level Sing augmentations, you became a mindless zombie who couldn't pry themselves out of virtuality. Yet now that he was here, mindless was absolutely the last thing that he knew himself to be. He could even peruse any part of Scripture, or anything written by any Christian theologian or philosopher since, just by thinking about it. Was that wicked?

So what exactly was he doing? Roger Sarner was due here in a few minutes, to get his own augmentations done – incognito of course. Today was May the 8th, the day of their mutual appointment, and Daniel already knew how strictly Sarner kept his commitments. If anything, he'd be early.

Daniel had to admit to himself that he was tempted just to walk out now and leave old Sarner to his own devices. For one thing, without access to Torch's money from Aurumnet, he'd have no way to pay for what he wanted done. Imagining that scene was amusing. But then, Daniel reflected, he'd probably just whistle up some of his goons and beat the shit out of the poor tech until he gave in and did it for free.

Maybe what he should do instead was spring for the best rig for Sarner as well. Would it change him at all, make him see being a Sing in a different light? Actually, you didn't have to be a genius to deduce that the probability of that was pretty near zero. Men like Sarner – or his father for that matter – didn't just change their spots.

On second thought, giving Sarner such a rig was impossible anyway. What he himself had just received was an upgrade, albeit a substantial one. But pure Moshes couldn't get a neocortex like his, not right away. The installations had to be performed in stages. And besides, all Sarner wanted was to be able to access the cyberverses and interface with others while there. He hadn't even asked for any knowledge-base access or mind-expanding experiences.

So let him get what he wanted, then. The question was, what did Daniel Cleary want? He wasn't entirely sure anymore. He knew that he didn't want to let down his dad, or the other people in the Order who were depending on him. Above all, he knew he couldn't let the Lord down. The heresies of the Sings had to be reigned in.

And yet, the more steeped he became in this so-called evil, the more he failed to find anything he could point to and say, "Yes, that is evil." It bothered him. This supposed plot amongst the High Sings was the closest he could come, and even if it was all true it's not like they were the first people in history ever to plot against each other. Was his father right in saying that the Devil's evil was so sweetly seductive that even as it ate you up, you couldn't see it for what it was? Was that what was happening to him, now? Or was he merely going on with this for his own selfish reasons,

because dismantling the cyberverses was the only way he could have the woman he loved with him here in 3D?

The mobile nanoclinic's door chime sounded. The technician switched on a view scanner over the door. Yep, Sarner, right on time. Looked like he was alone.

"That the friend of your dad's?" he asked Daniel.

Daniel sighed. "Uh-huh, that's him. Better let him in."

One of the most striking differences between a cat and a lie is that a cat has only nine lives.
-- [Mark Twain](#) (1835 - 1910)

Chapter 38
The Evidence of Things Not Seen

"It's really very good of you to help out with this," said Cylara sincerely. She looked down at the palmtop display pad she now held.

"You're welcome, though I can assure you that goodness has little to do with it."

Cylara fixed a measuring glance on the slight, lovely Japanese woman who had given her the datapad. She was dressed demurely in a belted kimono of an almost antique style, her silky dark hair pinned back away from her face to brush her shoulders when she moved. Her face was pale, classically pure, exquisitely molded, pretty almost like a doll was pretty. Her eyes, though, were jet black and intense, and so full of will and thought that they were almost frightening, completely belying the tender sweetness of her features. Something in their liquid depths, coupled with the way her mouth moved when she spoke, made Cylara think: *I would not want this woman angry at me.*

"Then you must want in return something that I can provide?" she queried gently.

"I want what you want. To find out what your boyfriend is really up to."

Cylara's heart sank. In that case it stood to reason that he must be up to something. She had hoped her suspicions were unfounded, but if this formidable woman thought there was something worth learning about Torch, then it was quite likely that there was – and that she wasn't going to like it at all when she finally learned the truth. She steeled her resolve. She had to know.

The two women stood facing each other on a beach, just above the reach of the fingers of water that fluttered up the sand as the shallow surf rolled lazily ashore. It was a warm late afternoon, nearing sunset. Although there

were some dwellings visible on the bluffs up above the beach, there was no one else in sight. Her moment of disappointment past, Cylara decided to focus on practical matters.

“So will this pad display everywhere Torch goes?”

A slight head shake, rustling her hair. “No. That isn't possible. When you brought him yesterday to the world I asked you to, his keyprint and neocortex client profile were recorded. Those identify him uniquely. His identifiers have been uploaded to a number of servers hosting a large number of virtualities. Any time he enters one of them, a log entry will be created and sent to the pad. But any world he enters that isn't watching for him won't record anything. And of course the system cannot track his movements in meatspace. The pad also contains a list of the participating virtualities which will generate log entries.”

Experimentally Cylara navigated to that list, discovering tens of thousands listed. “How did you get so many worlds to cooperate?”

Her benefactor shrugged. “Many hosting companies make treaties with each other under which they agree to share data on mutual visitors. This is done, for example, in cases of suspected fraud or other criminal activities which may cause economic harm to the operators or their legitimate customers.”

Cylara's heart sank a little further. “You think he's involved in something criminal, then.” Perhaps this woman was a private investigator or something.

“Probably not in the conventional sense. Despite the length of the list, only a small percentage of popular virtualities are represented on it. Don't expect a continuous stream of hits.”

“Right. Will it be possible to track his movements within a particular instance?”

“Yes, but only if you are zoned into the identical instance yourself, carrying the pad. It will then work something like crude radar, letting you home in on him.”

Cylara looked at the woman appraisingly. She gestured at the datapad. "Who do you have to be to get one of these, normally?"

"Typically, a sysadmin from a hosting company."

"But that isn't you, is it?"

A brief smile. "No."

"You're someone significantly more important, aren't you?"

A flash of something that looked like genuine amusement suffused her placid face, as if for a moment the ice had melted into a glow of almost sisterly affection. "Importance is a relative quality. You may think so if you wish."

Encouraged, Cylara pressed on. "I think you're a non-biological Sing."

The woman bowed ever so slightly. "That is so."

"Can you at least tell me your name?"

"It is Riksana."

"Riksana. Very lovely. Will we meet again?"

"I hope so. When your pursuit has achieved results, please send to me with this." Riksana handed over a small coin-like disc, whitish silver as if it were platinum.

"Thank you, I will." Cylara bowed formally, respectfully, in her best approximation of the Japanese style. Riksana responded, not quite so deeply, in the proper manner for one acknowledging the gratitude of another.

"I must go now," Riksana said quietly. "Until we meet again, Cylara Janovic." She did not zone out, she simply faded from view as if she had become insubstantial, or had turned her attention elsewhere.

Cylara pocketed the disc and the pad and strolled pensively down the beach. Why did something like this have to happen with all of her promising relationships? And why did she want to find out the truth so badly? Just so she could feel angry and disappointed? Was she that eager to find an excuse to break up with Torch, or was she, just maybe, hoping desperately to discover some deeper reason why she shouldn't? What

Riksana obliquely intimated about criminal behavior was far from encouraging. But then why should Riksana help *her* instead of some hired detective? Was it because of something special about Torch, or about herself?

She only knew that she felt melancholy about the way things were developing, yet couldn't turn back from it. It seemed that the sun was setting on her latest love affair, just as it had on all of her previous ones. Listening to the gentle surf, she wandered down the beach watching the simulation's sun make its slow, steady dive for the horizon.

Ignorance more frequently begets confidence than does knowledge.
-- [Charles Darwin](#) (1809 - 1882)

Chapter 39 Invasion

Roger Sarner, Torch, and the half dozen companions left to them pelted madly down a dark corridor, their booted feet banging on the steel floor and echoing off the walls. A thin illuminating strip along the crest of the vaulted ceiling revealed the passage ahead, but was too dim to shed any real light at their feet. Every twenty feet they passed through an arch of pale lavender light like a purple rainbow. The arches emitted just enough illumination to show the floor beneath them, but it was smooth and straight. Angry shouts and sirens echoed behind them, spurring them on.

Torch consulted maps in his heads-up display as he ran. They had to get out of this service tunnel before pursuers riding motorized vehicles overtook them. There, up ahead, on the right.

“This is it!” Torch hissed urgently as they came to an arch where a hatchway was built into the wall. It was oval and had a circular handle, like a pressure door on a ship. They skidded to a stop and clustered around while Torch keyed the emergency open switch and spun the lock. Somewhat to their surprise, it swung open immediately.

They burst out into what appeared to be a concrete drainage trench, flooded only with late afternoon daylight. Torch got his map bearings quickly. “This way!” he shouted, and took off running up the slanting far side of the trench. The others sprinted after him.

They emerged into the edge of a parking lot for cars of both the air and ground varieties. On the far side of it was a low building, with a taller tower bulking behind it, less than two city blocks away. That was where they had to go. Torch started a dash along the edge of the lot, giving up the direct route in favor of avoiding the people getting in or out of vehicles.

They reached the far side of the lot, and charged across a street and

down a broad sidewalk. At that moment, a pursuing air vehicle, which looked like some kind of modified chopper, banked around a building, following the canyon through the city streets at an alarmingly low altitude. It swerved toward them, reared back to take off speed. They could feel its wind beating down on them.

“Halt!” an amplified voice roared down over the craft's mechanized howl. In response, Torch flitted across the street and around the next corner, sticking close to some pedestrians, who had stopped in their tracks to watch open-mouthed at the eight fleeing men and the hovering chopper.

The chopper pilot kicked the craft into forward motion again, banked wide around the same corner. Single gunshots were fired from the flying vehicle, spraying shards of brick and sidewalk around them as they ran. Bystanders all along the street were ducking into doorways, or just hitting the deck. Torch could now see their destination at the end of the block. “Come on!” he exhorted, and Sarner and the others put on a matching burst of speed. One man cried out as a bullet pierced his hip. He stumbled and rolled to a stop. Torch looked back over his shoulder, but did not slacken his desperate pace.

As they sped across the final street toward the glass doors of their destination, one of the men twisted round and presented his rifle to return fire at the chopper. His shots either missed or spanged off the vehicle's armor plating.

Abruptly they were inside a busy lobby, where heads were turning at the sound of choppers and gunfire leaking in through the opened doors. Torch located the exit zone point, opposite a bank of elevators, and sprinted toward it, a cryptokey already spinning between his fingers. Sarner's men shouldered two other patrons out of the way as Torch fitted his key into a matching socket. The scan system lit up green. “Grab the zone bar!” he commanded, and the others stepped up next to him to do so, grasping a long silvery railing under the panel.

Just as Torch was reaching for the ZONE button, the console went dark.

Security men streamed out of one of the elevators across the lobby. More came in from the street, probably those who had been chasing them from the records library. Other patrons scattered to get out of the way as Sarner's men brandished guns. Someone screamed.

"Erisian security forces! Freeze!" an officer shouted. A dozen weapons were brought to bear as the security detail spread out. "You're under arrest! Put down your weapons! Now!"

Sarner sneered. "You're not even real, you asshole," he scoffed. "Disengage interface," he ordered, to the others. Torch shook his head in disgust, but complied. The world of Erisia faded out into a burst of grey static.

Daniel shambled into the clubhouse common room, truculent and ready for the inevitable argument. Sarner was there before him, drawing himself a cup of coffee, as were several others. They and their cyberversal invasion force had commandeered one of the charity housing projects the NAF had built recently in the northwest, displacing the free-riding residents at gunpoint. Over two hundred of their troops were now quartered here, where they could jack into the cyberversal at will. Daniel slid irritably into a chair at the big rectangular table, on the side opposite Sarner. Roger stirred creamer into his mug and sat down, looking at Daniel critically.

"That, Cleary, was an unmitigated disaster."

Even on short acquaintance, Daniel was expecting this accusation, and decided to take a different tack right away by agreeing with it. "Yes, indeed it was. And I'm afraid it's your attitude which made it one."

Sarner looked at him sharply. "Oh, really? And how do you figure that?"

"You must have been snoozing during the pre-mission briefing. You should have heard that Erisia is one of the first whole-Earth type cyberversal worlds, created twelve years ago. It's an old world that still retains several million consistent Sing inhabitants. But it's also a complete world, both in terms of its physical space and its overall population, which is nearly half a

billion. The founders' idea was to create a world similar to Earth, but without the defects inherent to Earth society. No war, no poverty, no pollution, no overpopulation, and with change occurring at a more bearable pace.”

“It was also made clear that the minority human inhabitants constituted an aristocracy that could do whatever they pleased, and that the vast bulk of the population were AIs who existed to serve the Sings who zoned in to live there.”

“Exactly. Which they can only do by maintaining order whenever disruptive visitors zone in and cause trouble. Mr. Sarner, on the advice of our informants, we went to the central records library in the capital city of Kalliste. Our aim was to obtain copies of records which had been lodged there at or near the time of the founding of Erisia, particularly if the documents could be associated with Justin Turrell or any of a list of people close to him.”

Sarner nodded. “Where the staff there were not at all inclined to be helpful, despite what we were promised, as you might have noticed. And, by the way, your kissing their asses undermined what I, and my trained investigative specialists, were trying to achieve by asserting our authority.”

Daniel shook his head. “On the contrary, your needless escalation only served to tip off the controlling AI that we constituted a disruptive element. One of your so-called specialists pulled a gun on a librarian. That naturally triggered a security response.”

“That was only after the librarian had already flat-out declined to give us what we wanted, in case you weren't paying attention.”

“Actually, the librarian said that some of the records were access-restricted, and hinted that we might need to obtain passwords from their custodians – which logically could only mean Erisian PCs. Our next step was obviously to inquire how we could contact those custodians and set up an interview.”

“We are not on a scavenger hunt!” Sarner said with evident annoyance.

“What was obvious was that the AI librarian could have allowed us access, and was just giving us the runaround with that get-the-passwords-from-my-boss routine.”

“No, he couldn't. Not if he was programmed not to. The thing you have to learn, Mr. Sarnier, is that cyberverses usually have their own internal logic, and it all works for the benefit of the users, or residents, of that world. That doesn't necessarily include random visitors. Do you honestly think that a world as old as Erisia has never experienced hoodlums zoning into it? When we threatened gratuitous violence, any AI in that world, humble librarian or otherwise, would be capable of recognizing that we were *not* the sort of people you want to go around introducing to the boss PC aristocrats. On the contrary.”

“Then, Cleary, I want you to find out who those bosses are in real life, and we'll have a little face-to-face chat right here about their access passwords.”

Daniel sighed. “That may not be possible now, at least not for us.”

“What do you mean?”

“Even assuming we could track a PC Sing back to their jack – which is practically impossible ever since your people blew up Ferret by mistake – anybody using our key fingerprints is simply *not* going to get into Erisia again. Not without raising an immediate alarm. We might as well zone right into a jail cell. In fact I'd be very surprised if *anybody* who showed up in that library asking for the same information didn't get pretty much that response for a while to come.”

Sarnier considered. “So what you're telling me is, we can't try again in that world, for now.”

“What I'm telling you is that we're screwed if the information we need is actually stored there. And that we'll get the same kinds of bad results elsewhere if you, and your people, don't figure out that you're not in the real world, and you can't just bust heads to get what you want, just because somebody – whether a PC or a NPC – gives you a hard way to go. We have

to work within the system, whatever that system happens to be. It's an infiltration, not an invasion, Mr. Sarner."

"Could be something to what you say, Cleary," Sarner admitted reluctantly. "But our Full Sing informants have given us more than a dozen virtualities to look in, and we just don't have the time for patient diplomacy. Establishing contacts, building relationships, fabricating identities, winning people's trust. Our special agents know that whole routine, believe me. But that stuff takes months, or even years. No time for all that. We have to shake something loose quick, or this is all going to be wasted effort."

Daniel brushed off this concern. "There are hundreds of thousands of virtualities out there, of all sizes. Millions if you count the micro special-purpose ones. By narrowing it down to a dozen, it's manageable. We have enough people to insert teams into all of the candidate virtualities at once. I've visited hundreds of virtualities in my time. So have some of the others. We can do it efficiently if we just keep our heads and ask the right questions."

Roger shrugged. "Then maybe I'll let you lead the team next time. I gotta admit it creeps me out some, being in a whole other world. It's been four days since I got these damn nanites in my head, and that's already too long. I don't understand what's wrong with people that they can't just stay here and work on this world. What the hell do we need Erisia for anyway, when things are going to hell here where it counts because of all the folks who'd rather live *there*? Makes me sick."

"Well if we're going to fix it, we need to blend in better."

"We also need more money. These access charges are racking up quite a bill. Everything costs. Everywhere you zone, everything you do and everything you use, they freaking charge for."

Daniel smiled indulgently. "Actually the microfees are tiny. We're just running up bills for almost two hundred people is all. A few pounds of gold would fund the whole operation for a while. Doesn't the Federation have any gold anywhere?"

Sarner nodded vigorously. "We sure do. Turned up a couple whole bars of it at the central bank. They had 'em saved there as museum pieces, leftover from when they sold all the gold, or leased it out and never got it back – their damned records are pretty unclear about just what really happened to it."

"Well there you go, then. That's huge. Just bail the bars into Aurumnet."

Sarner looked piqued. "Cleary, we contacted them, but they wouldn't even send us out an examiner. The pricks said the gold was stolen, and they couldn't take receipt of stolen goods."

"Did you tell them the gold came from the Federation?"

"Of course," Sarner said indignantly.

Daniel found himself torn between wanting to laugh and wanting to slap the Secretary upside the head. "Well that's *why* they considered it stolen," he explained. Sarner looked confused.

"But if the gold belongs to the government—"

"Mr. Sarner, don't you realize that to free market folks, anything which belongs to government, at least that far back, must be the result of either seizure or taxation, which they consider a form of theft?"

"Taxes aren't theft!" he began hotly, flushing red with irritation. "That's—"

"Would you like to try convincing Aurumnet of that? It's an AI, you know. Want to argue with a computer? Look, just transfer the bars to some private individuals and have them bail them in as their own, then distribute the digital coins around to the whole team. No problem."

Sarner stared at him balefully. "I don't want anybody so rich that they get any ideas about staying in there, living it up."

"Fine. Whatever. Let's just get it done so we can do our jobs."

Everyone doing their duty made sense to Roger Sarner, so he had to nod. "I've got to get back to Command HQ," he said. "The next mission is scheduled for 20:00 hours, to that city on Truferia, what was its name?"

"Eden. I'll lead the team in, if you like," Daniel volunteered, grateful that

Sarner would be absenting himself.

“Do it,” Sarner said as he rose from the table and stalked out of the village clubhouse.

Daniel Cleary glanced at the wall clock. Not quite 17:30. He had time to snag some food, go say hi to Cylara to stoke up his motivation, and maybe even catch a brief nap.

Erisia had looked promising. But now he hoped the List wasn't located there, or they might be a long time getting it. It seemed these damned Feds only knew how to bark orders and break heads. No subtlety. His dad had warned him about that, and as usual when it came to judgments about people, his old man was basically right.

Someday somebody might have to do Secretary Sarner like he himself, rumor had it, had done the President. Daniel sure as hell wasn't eager to watch helplessly while he screwed up any more List missions. Better to lead the men himself. The Lord worked in mysterious ways. Maybe He meant for Daniel to be His instrument.

The whole aim of practical politics is to keep the populace in a continual state of alarm (and hence clamorous to be led to safety) by menacing them with an endless series of hobgoblins, all of them imaginary.

-- [H. L. Mencken](#) (1880 - 1956)

Chapter 40

Switch and Bait

His escorts didn't seem to be in a hurry. Robert Reynolds was flanked by two Homeland Security guards as he paced down an interior hallway of an old hotel convention complex on the way to his meeting with Justin. Ostensibly present for his protection, the two bodyguards were really there to keep him from escaping or having any unauthorized contacts with anyone. Both men were young, poorly educated, and from a religious background. One wore a KOJ pin on his lapel. There was an increasing amount of that sort of thing going around. Plenty of Federation employees were getting religion these days. Originally, Roger Sarner had recruited the KOJ to supplement his forces, but Reynolds was beginning to wonder whether in truth Cleary's KOJ hadn't recruited the Federation instead.

It was actually rather a long walk across this old Helena hotel to get from the senator's suite to the conference center. This hallway was lit by old-fashioned lighting coils in sconces, bright enough to illuminate their way but dim enough to conceal most of the stains and tatters in the ancient carpeting, which was short pile and boasted a dazzling, if faded, floral pattern. The long corridor stretched past dozens of doors leading into empty, dusty rooms that had not been used in years. Fortunately, the suites the Federation party were actually using had been invaded by robotic cleaners last night before they'd arrived, making them at least habitable.

One of Reynolds' handlers stumbled on something, turned toward his partner with a startled gasp, and half-toppled, half-crumpled onto the floor. From the way his eyes were rolling up into his head, he hadn't merely tripped on the frayed carpet. The other guard exchanged startled looks with Reynolds as both of them knelt down to see what was the matter.

Abruptly the second man hissed out his breath in a sighing groan and rolled sideways to land supine on his back. Both men seemed to be unconscious now.

Reynolds braced his hands on his thighs and surged back to his feet, looking up and down the hallway. Now he saw them: two figures who had been creeping along behind them. One of them was putting something away into his pocket. A weapon? Who were these people, Cyberantes assassins? One of them, the smaller of the two, was masked. Both were wearing dark clothing. They began to walk forward calmly. Reynolds was quite sure they did not mean to attack him too, or the deed would already be done. In view of this he elected to remain silent rather than yelling for help; help being a relative term in any event.

To his considerable surprise, Reynolds suddenly recognized that the unmasked man walking toward him was Justin Turrell. The senator stumbled forward a couple of steps.

“What are you doing here, instead of in the conference room?”

“Springing you of course, my friend,” Justin replied conversationally as he offered the senator his hand.

Reynolds shook it with a smile. “Much appreciated. But what about the conference? Sarnar and his bunch are up there expecting us.”

“Oh, the meeting will go forward, never fear. It wouldn't do to disappoint his grand secretary-ship.” Justin unclipped another device from his belt, held it out, and waved it over each of the fallen guards. Then he aimed it at Reynolds, who could not feel any effects. It must be a passive scanner of some kind. Justin nodded to his shorter companion in the mask, the shape of whose body suggested a petite female. That individual silently produced a box-like object with a tiny holoscreen on one side and a small cone projecting from the side opposite.

A fog-like vapor streamed from the cone-shaped emitter, almost like an old smoke machine. As it grew denser, threatening to fill the wide hall, it coalesced into three tall oval forms. In a matter of seconds, these took on

humanoid shapes. As Senator Reynolds watched with open-mouthed amazement, the three vague bodies took on detail, color, depth, and solidity, as if absorbing them right out of the air. And suddenly there stood himself, along with his two minders. The faux Reynolds smiled warmly at the original, and flipped Justin the suggestion of a jaunty salute. Then the doppelganger set off down the hall, his guards falling into step behind.

Reynolds gaped at Justin as the latter calmly opened a nearby room door. "Help me drag these two out of sight," he requested. After only a moment's hesitation, the senator bent down and assisted. They deposited the pair onto the dust-laden bedspread covering the single large king size bed and returned to the hall. The room smelled even more stale and musty than did the hallway outside.

"They'll be out for hours," Justin explained as he closed the door behind them.

"What are those things?" Reynolds asked, jerking his thumb up the passage where the trio of duplicates could no longer be seen.

"Foglet bodies, made of billions of interlocking nanites."

"And controlled by an AI?"

"Oh yes. They can walk and talk and play your part to perfection, well enough to fool Sarner at any rate."

Reynolds nodded as he fell into step beside Justin, who began walking at a brisk pace in the opposite direction down the hall. Justin's nameless female companion sprinted ahead as if to scout. "I expect you have another foglet body arriving to play your part?"

"Yes, though it's not actually made of foglets, but real cells fabricated in a MM unit, just like this body. I'm expecting them to give it rather more scrutiny than a foglet facsimile might be able to withstand."

"Right. But then who's controlling that body, if you're here?"

Justin chuckled. "My Paia. She was the logical choice, since she knows me so well."

Reynolds grinned, suddenly feeling at least ten years younger and less

tired, ready to take on the world. They entered a stairwell, spiraled down a bunch of floors. "The parking garage exit will be guarded," the senator remarked. "We came in that way."

"I know. We have a foolproof way out, though."

"Glad to hear it." They arrived at the garage level and found their scout standing in the doorway holding open the stairwell door. She beckoned wordlessly and they followed her along the back edge of the garage, toward a dark corner. The lighting was spotty here due to most of the bulbs being dead or broken, and only weak daylight made it back this far from the entrance. Bits of trash lay in the corners, eddied there by the strong winds of winter seasons past.

Suddenly Justin's companion was opening a door in midair, which obviously led into a vehicle. An invisible vehicle. All three of them boarded and softly swung the door closed behind them, Justin taking the driver's chair.

"An invisible ground car?" Reynolds said incredulously.

"Yes," Justin replied. "We copied some technology that was developed by the Cyberantes for their body armor. It's not only invisible to radar, it's transparent in the visual and infrared spectrums as well. I'm going to rig silent running and try to slip out unnoticed by the guard at the entrance. Might not work, but even if he notices us at least he won't know what it was."

"How did you get this in here, then?"

Justin grinned. "Parked it here three days ago."

"Right after we agreed on the meeting location," Reynolds said, nodding in comprehension.

"Exactly."

They were sliding forward now, turning to face the bright squares of daylight at the far side of the building. As they drew close to the egress from the garage, they could see a single security man sitting in the old gatehouse, where once upon a time attendants had collected tickets and

parking fees from patrons. His feet were propped up and he looked like he might be snoozing. The mechanical gate bars were up, and in fact were broken off short, sticking up like fingers accusing hotel maintenance of permanent dereliction of duty.

Justin drove out through the lane farthest from the guard's booth, but something must have made a queer noise because the guard stirred, set his feet down, and stepped out of the booth to look around. His puzzled expression proved that he could not see them.

When they were about a block away, Justin switched over to an air travel mode, and the stealthed vehicle launched itself skyward and zoomed away. Reynolds found his spirits rising with the aircar. He had hardly dared to hope that he would ever be free again. Free to take action against the usurpers of the Federation.

"So where are we going?" he asked, presuming that Justin would have some specific destination in mind.

"To a secure house in the mountains above Boulder, Colorado. You'll be safe there, and have access to untraceable communications."

"Excellent. I can't thank you enough for this. But I will pay you back, never you fear," Reynolds said grimly.

Justin shot him a sharp but somewhat bemused look. "Actually, I wasn't hoping for any particular payback. I just thought it would be a good idea to get you out of there."

"Well whatever your motives, I'm grateful."

That idiot Robert Reynolds would undoubtedly have given away the store, had he not been negotiating in full knowledge of the fact that he, Roger Sarner, was present behind the one-way glass, listening in and accompanied by a full security squad. From inside the meeting room, the trick panel looked indistinguishable from an ordinary wall section.

This Justin character was slick, and all business. No wasted words.

Sarner could almost admire that quality about him. He wanted the Federation to issue a declaration affirming the right of all citizens to enter and inhabit the cyberverses without hindrance. In return, he would persuade the Cyberantes to stop interfering with Federation personnel. Which was a non-starter and no accord at all, as far as Roger was concerned. Reynolds of course, being spineless as usual, would have had no difficulty giving Justin what he wanted.

Sarner turned to his lead technician. "You got a fix on him yet?"

The tech nodded. "Yes, sir. We have the brain wave harmonics recorded."

"Outstanding."

The body of the man in the room was of course being run by the computerized Justin, like a puppet on a string. When that happened, the nanobots in its neocortex stimulated the brain's neurons so that the brain waves took on a particular pattern, like a sympathetic vibration. The higher harmonics of that pattern constituted a unique energy fingerprint. In theory, they could now scan for that fingerprint in meatspace, or in any virtuality into which Justin projected. It would show up anywhere that he was controlling a body. Which meant that they could now track him wherever he went, so long as they had someone in the same world with the necessary equipment. Portable equipment, that they were even now mass-producing.

Somewhere, Sarner knew, there must exist a world which this Justin Turrell entity called home. The Master Node List might very well be stored there, where he lived. Even if it wasn't, odds were good that Justin must occasionally visit the place where it was kept. Tracking Mr. Turrell around the cyberverses was now going to be Job One for young Cleary and the top cyberverses invasion teams. He even meant to take a hand himself, when he could.

Abruptly, Reynolds and Turrell were standing up, shaking hands over the table. The meeting was over. Sarner figured Justin had to be expecting

that he would be prevented from leaving, or else that his synthetic flesh would be tailed when he did. But they were going to surprise him and do neither of those things, since they already had what they needed. Let him think they were dealing honestly. This Sing was supposed to be a mastermind, so any advantage could be crucial.

The two security men reappeared to escort Senator Reynolds back to his suite. Sarner had been half expecting the Cyberantes to show up and hit the place in an effort to liberate the senator. But obviously that had been a needless concern. The studied deviousness of their enemies had him jumping at shadows lately. What use, after all, would a dumbass glad-handing politician be to a bunch of rebel anarchists?

The house overlooking Boulder was old and big, but well-built and plainly fully modernized. It sprawled at the edge of a steep slope running down toward the nearby city and commanding a wide view out into the flat, hazy distance of the plains. The three of them stood in the large living room, looking out the huge picture windows facing east. Reynolds was again moved to express his relief at being rescued.

"I want to thank you again, both of you, for getting me out," he said, in his most sincere tone.

Justin smiled. "I've freed you from Secretary Sarner's clutches, but I'm afraid it's beyond my power to free you from the prison in which you've locked yourself."

"I don't understand," Reynolds said, genuinely puzzled. Justin could sometimes get like this, but he usually explained himself.

"I mean that you seem to think that you can't live for yourself, that you have to serve others instead, almost as if you have no life of your own. And that you can fulfill this service only by controlling the use of force. You're quite mistaken on both counts, but I know I cannot persuade you of this. Happily, I've brought you someone who can." And he looked at his lady

companion, who was still masked.

Senator Reynolds turned toward her. So far she had scarcely spoken, and then only in a low, muffled tone to acknowledge his thanks. He was suddenly curious to know who she might be.

Almost casually, she removed her cap and face mask. Reynolds was so stricken by her revealed visage that he stumbled and nearly fell, so that she had to reach out to steady him.

"Marguerite! –" he gasped out.

"Rob," she said clearly, and the voice was suddenly exactly as he remembered it.

Reynolds looked wildly at Justin. "You didn't..."

"Oh yes I did, my friend. You need help I cannot provide. You have decisions to make. And things you cannot do without help. Her help."

Reynolds stared into his wife's face, and tears started in his eyes. She moved close to him and put her arms around his neck, looking up at him.

"I hear you've been a lonely workaholic these past ten years," she said gently. "Always out selflessly giving of yourself to others. I suppose I shouldn't be too surprised. But don't you realize I would have wanted you to be happy?"

He breathed stertorously, his hands trembling at his sides. Several times they started up as if to return Marguerite's embrace, but fell back. It was as if he realized that that gesture of recognition and acceptance would be irrevocable. "I wanted... to give something back..." he stammered.

She looked saddened. "Did you think you needed to do penance because we used to be happy together? That's so like you, Robert. But penance time is over. I'm back now, and we're going to be happy again." She tilted her face up and leaned forward to kiss him lightly.

"I..." He faltered and had to start again. "I can't believe... it's you."

She looked mock indignant now. "Justin warned me you would react this way. Well I can assure you that I'm as me as you've ever known me. And I'm not letting you off the hook, either. I need you as much as you need me.

That's why I insisted that Justin let me help rescue you. I love you, Rob.”

Was this his wife, or was she not? That question, which had paralyzed him since she uncovered her face, suddenly seemed not to matter. This person was alive, and she wanted and needed him. So whether the soul was the same or not, how could he not return her love? With a groan he enfolded her in his arms and buried his face in her hair.

Justin stood nearby, beaming benignly. When the reunited couple at last pulled apart, he spoke. “I think I should let you two go on getting reacquainted. Senator, you'll find an excellent communications terminal in the office down the upstairs hall. You know how to get in touch with me. Marguerite, it was a pleasure and thank you so much for your help. I look forward to seeing you both again soon.”

They nodded and murmured something polite, still looking a bit dazzled by one another. Justin turned and walked quietly out the front door toward his waiting aircar.

I hope our wisdom will grow with our power, and teach us that the less we use our power, the greater it will be.

-- [Thomas Jefferson](#) (1743 - 1826)

Chapter 41

Through the Cyberverses

The office park actually looked like a park, which happened to have an office complex in the middle of it. There were acres of lawns and flower gardens, potted shrubs in urns surrounding the intersections of paved lanes and sidewalks, and everything was green and white with colorful accents of many hues under a brilliant high sun. The office structure was huge and sprawling, with an eccentric, angular design and numerous wings branching off from the central mass, like the limbs on a starfish. It was all made of glass and some kind of alabaster stone, off-white like noble metal. Birds wheeled and whistled in darting flocks above the grounds. Although there was wide visibility across the park (none of the plantings were tall) no one else could be descried out walking around at the moment.

Roger Sarner and Torch stood at the entry zone point, looking around getting their bearings. Neither had any idea where they had just appeared. They were here only because one of their agents had reported detecting Justin's electronic psycho-signature in this virtuality.

Only yesterday, Justin had met in the flesh with Senator Robert Reynolds. And some hours later, Reynolds had been discovered missing, with his guards drugged senseless in a hotel room. Sarner was willing to bet that Justin had had something to do with that, though they still had no clue how he might have managed it. So when this intelligence on Justin's current whereabouts was received, the Homeland Security Secretary and *de facto* leader of the North American Federation had once again decided that he needed to put aside his work on big picture management, and concentrate on tracking Justin to his lair – this time with but a single helper.

They stood in a four-way intersection of walkways, surrounded by stone benches and urns in a Grecian style. Torch chose a path that ran toward

what appeared to be an entrance to the complex, and began walking that way. Sarner fell into step beside him. As they drew closer, the rows of large, dark windows, opaqued by the outdoor brightness, seemed to stare down at them. Torch glanced up quickly at the sun. For some reason, the principal light source in this virtuality was a bit richer and darker than that of Earth's sun, tinted more golden than white.

A large stone logo mounted on a granite plinth came into view, planted alongside the path near the ornate entrance which they were now approaching. It resembled a starburst, like a compass rose with many arrows of different sizes. Within its center circle gleamed two characters that looked wrought of solid gold, written in a simple, blocky font like that of an ancient computer display: **4F**.

Torch stopped for a second as the meaning struck him, then resumed walking.

"What is it?" Sarner asked.

"It just hit me. This must be the headquarters of Aurumnet."

"Oh? How can you tell?"

"That emblem. A golden 4F. The number 4F is the hexadecimal equivalent of 79, the atomic number for gold. I've seen that logo countless times before, usually in shops, who display it to indicate that they accept Aurumnet coinage."

"I see," said Sarner after a moment. "So why would Justin be visiting the corporate headquarters?"

"I don't know. Maybe he's on the board of directors or something."

Sarner grunted. That wouldn't surprise him. The way he'd heard it, this Aurumnet was widely used to support global mesh networking, via the DR.OS protocols. And evidently Justin gave away the original DR.OS code for nothing by publishing it as open source, so it made sense he had to be making his money somewhere else. It was clever, really. Get everybody to use your free software, then take a stake in the payment company everybody used to settle their access fees with one another.

Which still didn't explain what this place might have to do with the Master Node List, of course. A corporate headquarters office with lots of people working in it probably wouldn't make a very good hiding spot for that.

Torch and Sarner reached the big glass doors. Torch yanked on the metal hoop handle and the door swung smoothly open. Inside was a vast atrium with a reception counter at the far end. They paced across the glossy marble floor toward a man in a dark blue business suit who seemed to be the sole occupant behind the reception counter. Sarner guessed he was probably an AI, not a human at all.

"Welcome to Aurumnet," the attendant greeted them cheerfully as they arrived at his counter. "Visitor identification badges must be worn while on the premises. May I ask your names and purpose of visit?"

Given his much greater experience in dealing with cyberverses AIs, it was agreed that Torch would do most of the talking. "This is Mr. Sarner; I am Mr. Torch," he said now. "We're just here to tour the facility."

Roger thought that sounded lame, but somewhat to his surprise, the being simply handed them each a badge with their name on it, and gave Torch a portable holo-display which was evidently a map and interactive tour guide. "Please enjoy your visit to our headquarters facility."

As they walked away toward one of the wide hallways leading out of the atrium, Sarner leaned close to Torch and whispered: "Their security seems a bit lax, don't you think? They didn't search us, or even ID us."

Torch tapped the badge now pinned on his chest. "Not really. They probably scanned and ID'd us the moment we zoned in. And we *are* being monitored. I expect they're being unobtrusive rather than lax." Torch pulled their brain wave scanning device out of his pocket, held it in one hand while studying the activated tour guide display in the other. It located Justin's electromagnetic spoor about halfway down the wing they were now entering.

Roger couldn't help feeling a few pangs of jealousy at the magnificence of

this office complex. It was bigger and grander than any airport concourse or convention center that he'd ever seen. Although knowing it was all virtual geometry, and that therefore none of it really existed, certainly helped. The architecture was magnificent, the decor and furnishings spare but elegant. The carpet designs were like dim holograms which seemed to change subtly beneath their feet as they walked over them, almost as if their shadows or reflections were somehow being cast in the carpet fibers. Strangely, there were few other people moving about in the wide corridors.

Torch slowed as they neared Justin's apparent location, which was through a closed door on their right not far ahead. Abruptly he turned and darted behind a pillar as that door opened. Sarner instantly imitated his motion, and peered with him around the pillar.

A slight man with sandy blond hair and light eyes emerged, and began walking briskly away from them down the hall. Sarner nodded to Torch. This was indeed the same man he had seen yesterday through the false wall during the meeting with Reynolds. Torch had also seen him once before, and vividly remembered where: in Stefan's entourage, at a Cyberantes meeting.

"What's that room he's coming out of?" Sarner hissed softly.

Torch consulted their holo-map. "It's marked safe deposit private inspection," he replied wonderingly. They exchanged glances. "If they have a safe deposit facility here for digital information..."

"Then we've got to get in there," Sarner finished for him. Noting that Justin was almost out of sight around a bend ahead, he suited action to words. Torch wasn't certain this precipitousness was wise, but he swallowed his reservations and followed Sarner to the door and nipped in behind him.

The room was small, containing only a table and a couple of plush chairs. It was windowless, lit from high in the tall ceiling above. The overhead spot fell brightly on the center of the table. There in a low pile like a small pyramid were a half dozen solid gold bars. Torch could see that they were

hallmarked with serial numbers and certifications of weight and fineness, just like an actual gold bar might be in real reality. The two men stared nonplussed at the glinting bars.

“What the hell?” Sarner wondered aloud. “These can't be real gold.”

“Of course not, but they *could* correspond to actual bars stored in Aurumnet's custody. If they were quantscans of the real bars, I mean.”

“So he was doing what, inspecting them?”

Torch shook his head. “I don't know. Could be, I suppose.”

Sarner thought for a moment. “If these are some kind of digital tokens that show ownership of the bars, could we just pick them up and take them with us?”

Torch faced Sarner and looked at him incredulously. “You want to try and steal them?”

“Of course not,” he snapped irritably. “I don't break the law. We'd merely be seizing property that is, very probably, the proceeds of crime.”

Torch laughed. “Well if you want to set off probably every alarm in the place, go ahead and pick one of those things up,” he said gesturing at the piled bars. Sarner looked at the gold speculatively, but kept his hands by his side.

“Do you think the List could be stored in safe-keeping at Aurumnet, too?” Sarner asked in a low voice.

“Maybe, but I don't see why it would be. Granted, they must have really secure data stores, to keep all the ownership and transaction records. But such records are always audited, by powerful AIs. I can't see why he wouldn't be afraid that someone else would stumble over the List and guess its significance.”

Sarner grunted, obviously not convinced, still eying the stacked gold.

“Shit,” Torch said, eyes riveted on his scanner. “I think Justin just zoned out of here.” He led the way out of the booth and on down the hall the way Justin had gone. Sure enough, there seemed to be an exit zone point right near where he had disappeared.

When they arrived at the terminal themselves, Torch considered carefully. "He was the last person to use this zone point. If I can get this scanner to synthesize an electronic brain wave pattern that duplicates Justin's, I might just be able to fool the terminal into showing me where he went." Torch manipulated some controls. It was really handy to be able to access the design schematics and manuals for both the hand-held scanner and the make and model of the zoning terminal, just by thinking about it. He'd never before thought of himself as some kind of technical whiz, yet suddenly he had the exact cyberspace coordinates Justin had entered only minutes before, displayed right there on the terminal.

"Hot damn!" he exclaimed. "You wanna follow him, sir?"

Sarner raised his eyebrows as if to say, what kind of question is that? They both grasped the bar and Torch pushed the ZONE button.

Bizarrely, they found themselves inside a Gothic cathedral. It was packed with well-dressed nobles and churchmen in rich vestments. They stood at what must be the west end of the nave, near the entrance, looking across the dense crowd toward the east end, where glorious morning sunlight streamed in through the massive clerestory windows high in the apse. It was cool in the cathedral, despite the press of bodies, and the sunlight pouring through the stained glass angled in from the south.

Their client interfaces had adapted to the locality, and each of them was tricked out like a lord, with plenty of brocade and those ruffly round collars under their chins. Under the dome at the east end of the church, a collection of bishops and lesser clerics were performing some ritual concerning a richly dressed man lying oddly prostrate on the floor on a rug, with his arms flung out in the attitude of a cross and his back to the crowd. Choirs of monks who were crowded into the north and south transepts chanted in Latin, giving responses to the priests up front. But the whispers they could overhear from those nearest to them were not in Latin, but in

antique French.

“What the hell is this?” Sarner said in a hissing whisper, in modern English.

Torch gave him a reproving look, answered in French. “An historical re-enactment.”

Sarner looked exasperated, then startled to realize he could understand a language he wasn't aware that he knew. “Well I can see that. But of what?”

Torch was curious about that, too. Abruptly the prone man rose and turned to face the crowd. Torch imaged his face and experimentally requested identification. At once he obtained a very fair match to an historic portrait, and then the rest fell into place.

“I think that man is Henry IV of France, and this must be his coronation,” he whispered back. “In which case we are standing in a recreation of Chartres Cathedral as it existed on 27 February, 1594.”

Sarner looked openly baffled, shrugged and gestured with his hands as if to ask what was the significance.

Torch shook his head. “I'm not sure. I know Henry had to change his religion in order to become king, and later encouraged religious tolerance.” He looked around for Justin, who had to be here somewhere. He studied the faces of the clerics up front, but didn't recognize any of them. Then one of the grandly accoutered lords up near the front looked behind him momentarily, and Torch's formidable pattern-recognition abilities instantly picked out Justin's face. He scrutinized the emblems on the man's embroidered surcoat and matched it against a database of family crests of late sixteenth century French nobles.

Torch tugged on Sarner's sleeve and discreetly pointed at the nobleman, who had turned back to face forward. “That's Justin over there. He seems to be playing the part of Maximilien de Béthune, baron de Rosny, Henry's right-hand man.”

Now Roger Sarner looked completely put out. “To what end? This guy's

supposed to be some kind of mega genius, why doesn't he just make himself the king? And what's the point of being king over a virtual domain anyway?"

Torch had no good answers for him. But unlike Sarner he wasn't quick to assume that there was no point, only that the point was not yet understood.

Someone else, however, was equally quick to assume that Torch and Sarner had no business standing there muttering at each other during the ceremony.

"My lords, please come outside," said an authoritative voice. They were confronted by a very concerned-looking priest, accompanied by several burly monks. A retinue of armed men was visible outside on the cathedral steps, looking their way but evidencing reluctance to step into the church with drawn weapons. Torch had no doubt that they would, though, if the priest requested it. He exchanged a glance with Sarner and they complied, stepping out among the guardsmen. A much vaster crowd lined the hilltop surrounding the cathedral, obviously made up of those not deemed important enough to merit places inside.

The priest and the guard captain gave the two visitors the fish eye. "Who are you, sirs? Are you invited guests?"

Before Torch could stop him, Sarner growled, in English, "I don't need your invitation, you virtual prick." Torch winced, despite the fact that a true French cleric from 1594 would doubtless have trouble parsing that sentence, even if he did speak English. But the withering, disrespectful tone was enough.

"They are English!" someone shouted. Then another voice: "They could be assassins, sent by Elizabeth to kill the king for returning to the Church!" There was an answering commotion, and the guards surged around the pair, weapons bared. This situation was going from bad to worse quickly, Torch reflected. He suspected Sarner was probably unaware that, depending on the rules of the simulation, the pain which would be inflicted upon them by those sharp weapons could be intense and very real, despite

the fact that they could not, of course, inflict actual injury upon their physical bodies in meatspace.

"We're not English," he said in perfect, colloquial upper-class French. "And we're no assassins." He gave Sarner a reproving look, suggesting that he correct his language deficiency. Unfortunately, he did more than that.

"No, we're not," he agreed, also in French. "Though your king will in fact be assassinated, in 1610 if I recall correctly."

The priest gaped at him. "And how would you know that, my lord?"

Sarner sneered. "Because it happened more than four hundred years ago, you idiot. In real life. But this isn't real, and you don't even exist."

Torch sighed, wondering where the nearest zone point might be. Obviously the die was now cast, so he might as well explain what was about to happen to his associate. "AIs in simulations are usually programmed to react appropriately to whatever is inappropriate to the simulation, you know," he said over his shoulder.

"They're not spies, they're witches!" someone yelled, and cries of "demon" and "sorcerer" rang out through the crowd. The priest gestured angrily and they felt the heavy hands of the guards on their shoulders.

"You are under arrest," the guard captain expostulated. "Move!"

They were frog-marched down the hillside and into town. Torch offered no resistance, and signaled Sarner to do likewise, because he had found and interrogated an administrative interface, and discovered that the nearest exit zone point was hidden in a tree trunk on the far side of town. So at present they were going in the right direction anyway.

But as soon as the men wanted to turn aside into a foreboding building that evidently housed some kind of gaol, he nodded at Sarner. The two men then turned on their captors. Applying superhuman strength and reflexes, to say nothing of martial arts techniques completely unknown in France of this period, they quickly demolished the guard squad and left them writhing in the muddy street, gasping for breath and holding various painful parts of their anatomies in lieu of their weapons. Then they sprinted

away, Torch in the lead, heading for the exit.

An angry roar of townspeople and soldiers pursued them, carrying whatever weapons were ready to hand. With tireless superior speed, they were able to keep ahead of the spreading uproar clear to the far side of the town. The situation was so ludicrously like one of those old movies with the peasants chasing after the supernatural baddies with torches and pitchforks that Sarner had to laugh as he ran.

Torch spotted what must be the right tree up ahead, and angled toward it. As they ran up, suddenly they could see the control console through the trunk as though it were superimposed on the bark. Torch entered coordinates, saying "Grab hold!" as he did so. They gripped the tree as Torch hit the button. Reformation era France faded.

They emerged in a library, filled with old books and the smell of antiques. Roger broke out laughing. "That was kinda fun. Did you see the looks on their faces? I can almost see why some people get addicted to doing this kind of shit."

Torch tried to keep his disgust off his face, not entirely successfully. "That's beside the point. Sir. The fact is, we left before we learned anything useful, and now we can't track Justin through his next zone. Even worse, if he hears about what happened, he may deduce that he's being followed."

Sarner shrugged. "He couldn't know who's doing it, or why, or that we can pick up his trail again."

Torch shook his head. "You hope. I'm going back to Chartres, using a reconfigured avatar, to stake out the tree and see if I can find out where he goes next, same way I did before. Why don't you zone out? I'll message you when I have something."

"Right. Fine." Sarner didn't look the least bit contrite, and Torch understood that no apology for the inconvenience would be forthcoming.

The library's card catalog was the zone terminal. Torch went over to it and reversed his last zone. He had no idea where Secretary Sarner would

decide to go, and right at the moment he couldn't care less, so long as it was someplace else.

Later that day, Sarner rejoined him in the next virtuality that Justin visited after Chartres, to which Torch had tracked him without much difficulty. It was a white sandy beach on a hot summer day. From the visual clues presented by nearby buildings, vehicles, signs, and the clothing people were wearing, Torch estimated that the setting was somewhere on the Spanish Riviera in the late 1990s. Not that there was much clothing in evidence. The group of people splashing in the surf close at hand were all young women, and they were all topless.

Sarner looked over at the women and broke out laughing. "Hoo boy, the great genius sure spends his time living in a geek's paradise. From gold magnate to king maker to playboy. Gotta love it. Hey, maybe he'll be pope in the next one, and give himself absolution."

Torch gave him a dark look. "We're here to track him and see where he goes, until he visits the world where the List is."

"Yeah, well this ain't it, unless you think one of those honeys has it stuffed in her bikini bottom."

"I doubt it."

"So do I. For one thing, there sure wouldn't be room to hide it." He laughed again, started walking over to the women. They saw the two men approaching over the sand, came prancing out of the water, and stood in a loose semicircle to meet them. *Damn*, Torch thought. Some of those girls really had a prance on them.

"Hi ladies," Roger said as they reached easy conversation range, this time wisely using Spanish without being prompted. They smiled and waved.

"What can we do for you, big boys?" one said.

Torch grinned. "We're looking for a dude, white, about five nine or ten, sandy blond hair, pale blue eyes, slim build. You seen him?"

The señoritas laughed. "You got all of us here, sweetie, and you're

looking for a guy? How disappointing.” They laughed some more.

Sarner's smile was wide but cold. “It's business, see? We're following him.”

“I think this one must be a cop,” one senorita said in a pretended aside to her friend.

“Yeah,” the friend replied in a stage whisper. “You can see the donuts.” More laughter.

Sarner drew himself up slightly and Torch was getting the feeling that he might be about to say something inappropriate to the simulation again, but just then he noticed a strange thing. There were footprints in the sand going along the beach. He'd assumed at first glance that one of the girls had made them, but they led all the way down the shore, and unlike the ones the bathing beauties had left, these weren't fading away as the waves rolled over them.

“Who made those footprints?” Torch asked, pointing, forestalling whatever Sarner was going to say.

The merriment died down. One girl, a tanned raven-haired beauty whose bodily proportions were just... achingly perfect, met his eyes with a sad little smile of genuine regret. “Oh, a cute blond guy, about five foot ten,” she replied with a sigh. “He went through here a little while ago, and he didn't stay, either.”

Torch felt a flash of empathetic sorrow. These women were clearly AIs who were programmed to be, well, what every young man desired. He understood that the sophistication of their emotional responses made them susceptible to loneliness. And that they had to stay here, whether anyone came to walk on their beach or not. How long had it been since they had last seen a visitor, before Justin arrived? There was no way to tell. Or to tell how long it might be until the next, or until this simulation fell completely out of use and was abruptly discontinued by its operators.

Would that be death to these beautiful, friendly, desirable Spanish women? Or would they someday be recycled into another virtual creation,

to live again, and love again? *If they weren't, it would be a damned waste*, he thought. Torch found himself wanting to comfort them, even to take them with him away from this place to somewhere they could live and be happy.

It was odd, really, that normally he just didn't think of virtual AIs as beings in need of fulfillment or affection, especially considering that quite a lot of them existed at or even above biological human norms for intelligence, both analytical and emotional. Did created AIs like these women have a right to pursue freedom, and happiness, and self-determination, the fulfillment of their goals and desires, just as those who had been born human did?

Torch wanted the answer to be yes, and he hoped desperately that this dusky girl could read that sentiment in his eyes. At the same time, he knew that he personally had nothing to give to any of these women. They weren't Cylara. And that was really all there was to it.

"I'm really, truly sorry that we cannot stay," he said softly. "But we must follow the man who made the footprints."

The women nodded somberly. The perfect dark-haired one reached out and touched Torch lightly on the shoulder, for just a moment. The touch of her sweet fingers was somehow searing. "You're in love with another," she said simply.

"Yes," he replied. She smiled, eyes sparkling with mingled mischief and regret.

Sarner looked at him sidelong, obviously trying to deduce just what had passed between Torch and this clutch of girls who had been so rowdy a moment ago and were now so serious. Torch said nothing, but beckoned him to follow as he set off down the beach along the line of footprints. They could hear the laughter and the splashing as the women ran back into the surf behind them. Torch forced himself not to look back.

It made no sense to him that the sea wouldn't wash away Justin's footprints. Their own, like the girls', washed away without trace in only a

few wave impulses. What made Justin's special? How was it possible to alter the rules of a virtuality like this, merely by walking through it? And why was Justin doing it? Did he indeed realize that he was being followed, and left them a plain trail so they could do it more easily?

If that was the case, then he'd probably be lying in wait somewhere up ahead, hoping to discover who was tracking him, and why. Which was a rather sobering thought. Still, Torch's feeling was that the business with the footprints was incidental, or at any rate served some other purpose besides the obvious.

As he trudged down the beach through the heavy, wet sand, Torch was reminded of the old anecdote about the man who had complained to the Lord that during the hardest parts of his life, there was but one set of footprints in the sand behind him. And the answer of course was that during those times the Lord had been carrying him rather than walking beside him. Was that the message, that God was carrying Justin through these times of trial? That didn't sound right, yet the more he thought about it the more Torch became convinced that this trail in the sand was intended as a message of *some* sort.

"You could have been right," Sarnar admitted heavily after they'd walked a while. Torch understood intuitively that apologizing for mistakes wasn't something that came easily to this man. "Maybe he does know he's being followed."

"That thought had occurred to me," Torch agreed. "As has the thought that maybe he's always known."

Sarnar let that go unanswered for a good number of steps. "Meaning you think he wanted us to follow him, from the beginning."

"Maybe."

"In that case, presumably we'll be walking into some kind of trap at some point."

Torch shrugged. There wasn't really much danger they could run into within a virtuality. There were ways to make one dangerous, but not

physically, only psychologically. But somehow that didn't seem to be Justin's style.

A house came into view. It was painted white, with a white corrugated steel roof, pentagonal, built on a point of land thrust out into the surf, perched on a rocky ridge some twenty feet above the high tide mark. It was suddenly obvious that Justin's tracks must lead to it, since there was no other discernible destination in sight.

They approached the building cautiously. Sure enough, Justin's tracks disappeared at the base of a wooden plank staircase that ran up the rock face to the house. They watched for a while, looking for evidence of movement inside. Seeing none, after several minutes they stealthily climbed the stairway. The outside door of the beach house was unlocked.

Moving in swiftly but silently (Sarner evidencing his long-ago police training in the decisive yet deliberate cat-footed way he moved) they quickly ascertained that there was nobody in the building now. Torch pulled out their brain wave profile scanner and confirmed that Justin had recently zoned away from here. Which meant that the house must contain a zone point.

Aha, over here at the wet bar. Torch beckoned Sarner over, activated the panel.

"So he zoned in here, walked a couple miles down the beach, and zoned out again. What for?"

"Visiting memories? Who knows." Torch studied the controls, again used their scanner to conjure up a fake Justin fingerprint which fooled the console into redisplaying its last destination setting. He was getting adept at this.

"So where'd he go next?"

"Place called Palandria. I've heard of it. Some kind of mesh tribe fantasy world, an old one. Swords and sorcery, that sort of thing."

Sarner snorted. "More geek stuff. Okay, bring on the dragons and unicorns."

The landscape looked distinctly volcanic. The rocks were dark and rough, and nothing grew on them. Bits of pumice crunched underfoot. Wisps of smoke or steam eddied along the ground in places. They were in a valley hemmed in on three sides by steep, basaltic cliffs. Frowning grey clouds loomed over the tops of the ridges, billowing slowly. On the fourth side, behind them, the valley opened out into lowlands which began to be dotted with green: bushes, stunted trees, patches of grass.

Directly ahead of them was a kind of ruinous stone structure, roughly circular, largely fallen down, with shattered pillars and collapsed arches lying where they had fallen, as if hurled there by some colossal earthquake in ancient times long ago. One lone archway was still intact, and gave entrance into the courtyard of the fortress, or monastery, or whatever the structure had once been. Just inside the intact arch stood a kind of tent, or perhaps a tepee, of irregular shape, made of hides rather than canvas. A fire crackled beside its dark entrance, and a ragged old crone bent over the fire to tend it.

Torch knew from experience that settings and personages such as these were usually related to quests of some sort. Since they were in fact on a kind of quest themselves, this felt encouragingly appropriate. One other observation also occurred to him: this was obviously no ordinary entrance zone point. In worlds of this kind, such were usually located around towns and settlements established in friendly, or at at any rate less dangerous, territory. This must be a private or elite entry point to which Justin had access. Which meant that in game world terms, they were probably in a danger zone.

Torch shared his assessment with Sarner succinctly, and moved toward the old woman. She straightened up, leaning on a thorny walking stick, and awaited them. When they reached her camp, Torch bowed and greeted her respectfully.

"You are come to the ruins of the Courts of Minos," she informed them sternly, looking them up and down. "You should not enter here. You do not possess the necessary skills."

"We have special skills which are not apparent, madam," Torch returned with another bow. "And we are on quest, under a geas. We have no other choice."

The crone's piercing eyes stabbed at Torch, as if measuring his sincerity as well as his worthiness. "Very well," she said at last. "As the Guardian, I must inform you that you have only two choices. You must go up, or you must go down."

"Up or down to where?" Sarner asked impatiently.

"To your destiny, of course. Up will take you to the center, where you may see much but touch nothing. Down will take you into the maze, which also leads to the center, but where that which you perceive may also touch you."

"Then, Guardian, we must go down," Torch said at once.

The Guardian laughed raucously. "You will not survive the maze."

"Nevertheless we must attempt it."

"Very well then." She stamped the heel of her stick on the ground beside her foot three times. A nearby wall appeared to vanish, revealing a stairway descending into the earth, lit by flickering torchlight. Torch and Sarner exchanged a look, and the latter rolled his eyes. They walked away toward the stairs.

"One matter more," the Guardian called warningly. They paused. "What you seek lies within. But unless it is truly yours, you will not possess it." She cackled again.

"Whatever," Sarner muttered. "Let's go." He led the way down the stairs, picking up a lighted lamp depending from a hook on the wall. As Torch followed him and did likewise, there was a grating sound and the passage closed behind them.

At the bottom of a short incline, the tunnel opened out into a wide, empty

space, too vast for their lamplight to reach across. A number of tunnels appeared to radiate outward from the cavern, like the spokes of a wheel.

"The List really could be here, I think," Torch opined. That brought Sarnar up short.

"What makes you say that?"

"Because this world is old, going back about twenty years. There are few older. And I seem to recall reading somewhere that Justin was a founding member here. He's some kind of arch wizard. And this maze. It's a perfect hiding place. That old seeress was right. We'll probably never reach the center. It'll be guarded by monsters we have no chance against. In this world, we're what's called noobs. We haven't acquired the weapons, or the skills, or the magic that would be required to negotiate an advanced dungeon such as this."

"What kind of monsters are you expecting?"

"Well, the Courts of Minos, with a maze, what does that suggest to you? Think about Greek mythology."

"You think about it."

"I have, and I think you're probably not the only bull-headed man I'll see in here."

"A minotaur?" Sarnar said incredulously after a moment.

"Probably *The* Minotaur. I imagine he's the boss monster at the center. And just possibly, he's also the guardian of the Master Node List."

"But why wouldn't someone have taken it by now? I mean, the point of these dungeon simulations is for the players to go in and kill the monsters and get the treasure, right? So even if we don't have the magic or whatever to do that, there would be players who do, right?"

"Presumably. But remember what the Guardian said: if it doesn't belong to us, we won't get it. To me that suggests that the only way the Minotaur will give up the List when he's defeated is if the players who kill him are on the proper step in a series of goals, known as a quest. Otherwise they won't get credit, even if they win."

“Are you saying we're going to have to waste a bunch of time playing a stupid game, to do all the quest prerequisites and gain the necessary skills, before we can get the List off the Minotaur?”

“That's possible. Think about it. It makes sense. Justin is an expert at this game, a top-ranked player of long standing. Any world such as this has its own internal logic, which is inescapable, as immutable as light-speed. What this means is that here, he can hide the List in a place where almost no one else can get to it, but he can. And if anybody starts going through the quest sequence, he'll probably find out about it long before they get to the final step.”

Sarner was obviously peeved. “But how can something real get hidden in a goddamned game world?” he asked indignantly.

“Mr. Sarner, it's just data, like any other virtual item. In this world it's probably instantiated as a stone tablet or an ancient scroll or something.”

“And if we start doing the quest for the Tablet of the Minotaur or whatever, Justin will probably hear about it, come running to head us off, and turn us into newts or something. That's just freaking fantastic.”

“I don't know. But before we decide to start training up our squads as Dark Age Ascending players, I'd like to take a trip to the center to confirm whether there is a Minotaur, and maybe something that might be the List.”

“I thought you said we'd never make it.”

“I also said we had special abilities that weren't apparent,” Torch returned smugly. He pulled the brain pattern scanner out of his pocket and fiddled with its controls, again generating an electrical pattern like Justin's electromagnetic brain-wave signature. He waved it about and when nothing happened, turned up the gain to maximum.

A glaucous thread of light, like an etiolated vine, appeared twisting in midair. It lead down into the cavern and across it at an angle toward one of the exits. Experimentally, Torch took a couple of steps along the path it marked out, and the hovering line brightened and seemed to extend further.

“He left himself a map,” concluded Sarner.

“Yes,” Torch agreed. “Like the thread Theseus and Ariadne used in the mythical Labyrinth on Crete. Which indicates that a safe path to the center must exist. Uber wizard or not, Justin would hardly want to have to fight his way down every time he paid a call on the Minotaur.”

“Good thinking, Cleary,” Sarner complimented. “Let's go.”

They followed the ribbon of pale green light down a wide, echoing tunnel. Soon they began to take turnings left or right, and up or down flights of uneven steps, negotiating the bewildering branchings of a vast underground maze. There were more stairs down than up, and passages that seemed to spiral inwards and downwards. Nothing was marked or labeled, and frequently their course selected the narrower or less obvious way at intersections. Faint howls and rustlings came distantly to their ears, and scurrying and muttering beings seemed at times to be ahead of them, or close behind them. Once while crossing a large hall, a dimly glimpsed bulk moved ponderously just beyond the reach of their lamps. The Labyrinth smelled dank, with a musty decaying smell, sometimes drier and sometimes fresher and wetter, like rotting leaves. Occasionally they stumbled over what appeared to be the bones of unknown creatures.

There was absolutely no doubt that the place was a gigantic trap, and that absent their traversal of a safe route through it, their passage downward would have been ferocious. And probably almost immediately fatal to their unskilled, unequipped virtual avatars.

All at once they ducked through yet another low adit and found themselves in an immense torchlit fane. A grand building made of marble, like something whole from the Acropolis, stood on top of a pyramid of tall, deep steps. It looked like a temple, but appeared to house a library. Something, some distant light source, shone faintly on the roof of the library from above. Torch gasped, realizing that it was probably daylight. The whole immense chamber appeared deserted.

“Maybe he's not at home,” Sarner speculated. “You think that library contains our data?”

“It would be a good bet,” Torch breathed. “I wonder if we can get to it?” Their twisting map line had terminated here, but he kept the scanner switched on anyway, in case there was anything else here that was programmed to be more friendly to Justin than to some random interloper.

“Nothing ventured...” reproved Sarner, and started toward the steps. They had to negotiate the steps one by one, scrambling up to the top of each before the next could be attempted. They were evidently scaled for gods, or for giants.

At the entrance to the library, Torch looked up. Sure enough, there high above was a tiny square patch of blue, with a small thin cloud scooting across it. There seemed to be a balcony up there at the top of the shaft, too. And was that someone standing on it? Difficult to tell.

Sarner strode boldly into the library, checking out the labeling on the thousands of pigeonholes containing scrolls, and written beneath the shelves holding books and tablets. The lettering appeared to be Greek at first glance, but upon closer inspection proved to be something unrecognizable. Torch supposed it must be some Palandrian language, but one which his mesh interface for once could not identify.

A dark, guttural voice pronounced something aloud which could well be in the same language. Torch and Sarner looked around, alarmed, but could see nothing. Then a very tall man stepped around a pillar to confront them.

He was easily ten feet in height, maybe twelve, strongly built, especially above the waist, so that he looked top-heavy. He was clad in studded leather armor, and had the head, or at any rate the face, of a bull. The horns on his head were the only non-canonical element to his appearance: they seemed to be incorporeal, made of some kind of pulsing energy, a dark sea green in color. The horns danced and flickered on top of his head, rising and falling in a rhythm almost like respiration.

The Minotaur looked genuinely flummoxed for a moment, then indignant. He pointed at the scanner device in Torch's hand, and said something else. Torch didn't understand his rumbling, but got the point. He switched off

the scanner and put it away. The Minotaur pointed at them, uttered something else in an angry tone. Again the meaning was obvious: they did not belong here.

Torch made placating gestures with his open hands, backing away slowly out of the library. Sarner edged along beside him, also facing the monster, his face clenched somewhere between snide amusement and fearful apprehension. The Minotaur bowed his head toward them, bending mainly from the neck so that his bovine muzzle sank to his chest. Torch was just wondering whether this was some formal or ritualistic greeting to which he must respond, when he realized that the beast was pointing his glowing horns at them.

He started to shout a warning just as the horns flared. What looked like an impossible kaleidoscope of fragmented virtualities rippled toward them, as if the Minotaur had shot at them with a machinegun that fired holographic projections of scenes from hundreds of worlds. The projected images did not strike them, but encased both men in cocoons of faceted and whirling planes, like a hall of mirrors with a hundred surfaces each providing a view into a distinct universe. It was bewildering beyond comprehension, yet maddeningly fascinating.

"I don't think we can escape," Torch said as calmly as he could. "I think we'd better drop our connections and zone back out to our jacks." Sarner grunted agreement, shading his eyes from the whirling micro-portals into alternate realities that danced and spun before them.

Somehow it didn't work. No matter how many times he activated the manual emergency disconnect, the interface did not respond. Torch felt a clutch of cold panic. Something in the sensory stimulus overload must be blocking the command link.

"Why can't we leave?" Roger Sarner hollered, characteristically sounding as angry as he was frightened.

Suddenly, Torch thought he understood. Every one of these projections was a potential zone point. If they gave their full attention to any one of

them, they would fall into it. The presence of so many zone thresholds around them must be overloading the control interface with a feedback loop, making disconnection impossible. A chill smote him, almost like a physical blow between the shoulder blades. What would happen if they zoned involuntarily at random? Would they then be able to disconnect normally? Or would the feedback jamming persist in their new location?

Only one way to find out. Torch selected one of the myriad jittering picture frames around him and focused on it to the exclusion of all else. It showed a meadow full of butterflies, with a brook winding lazily through it. Innocuous enough. Suddenly he was there! A few cattle grazing in the pasture looked up, startled at his sudden appearance. The simple buzz of bees and birdsong sounded loud and glad in his ears after the tinsel cacophony he'd been shutting out. He breathed a sigh of relief, and triggered his interface disconnection again.

And with a swirl he was back in the Minotaur's cavern, amid the gyre of beckoning virtualities. Sarner was on his knees, groaning and hiding his eyes. "Cleary!" he bellowed. "Get us out of this!"

If only I knew how, Torch thought. He'd been wrong, stupidly wrong. Justin did have a trap waiting, and there was after all a way to make a virtuality dangerous. Or in this case, a thousand virtualities dangerous. Torch looked around, trying to focus beyond the screen of maddening facets, but he could no longer see the Minotaur clearly. Perhaps he had moved away again after trapping his victims.

Desperately, Torch looked upward. There, forever out of reach, was that distant blot of sky. Could he focus on that, and resist the pull of the wheeling worlds? "Look straight up!" he yelled at Sarner. "Stare at the sky and concentrate on it!" In his peripheral vision he sensed Sarner rise and dizzily comply.

At that balcony up there. Was there – there *was* someone standing on it, someone waving. Excitedly, Torch waved back. The figure's motions changed, and something else that was moving caught his eye as well. It

twitched back and forth, wiggling, approaching, getting closer. Suddenly he understood. The person up top was lowering a rope! One with a weight on it, headed directly for him.

The weight, a large lava stone, swung through the glittering portals without shattering them, or zoning into them. Torch caught it, tugged on the rope sharply a few times, and it stopped descending. He was wondering what to do about Sarner when a second weighted rope came spiraling down.

“Catch the rope,” he told the boss.

“Right, I see it.” Once Sarner was also holding a rope, they stood expectantly. But the ropes did not rise to lift them up. After a moment, Torch started climbing. He half expected to feel some restraint from the trap, or worse, the grasping giant hands of the Minotaur clamping like vises on his legs. But there was nothing, and he climbed vertically straight out of the trap. Sarner, beside him, did likewise. This would be no problem. It was what, a couple of hundred yards?

Exultant, tireless, no longer scared, Torch climbed eagerly hand over hand. The figure at the projecting balcony seemed to be climbing too, going back up a spiral stair cut in the side of the shaft. That was odd. Why wouldn't their rescuer wait? At the very lip of the mine shaft, the figure now stood, looking down. By its size and shape, it was a woman. But not the old crone from the entrance.

Torch reached the balcony and clambered onto it. Without waiting for Sarner, who was a few seconds behind him, he started up the stone stair leading out of the Minotaur's pit. As he rounded the curve he got a clear view up at the standing figure, upon whose face the sunlight was now shining.

The hand that he was raising in tentative greeting froze in mid-motion. It was Cylara. He found that he could not speak. Though he desperately wanted to say something, as with a steely expression she turned silently away and vanished.

“Cy!” he shouted, and sprinted up the rest of the steps. Blinded and dizzy, he staggered around in the bright, smoky sunshine, spinning wildly to spot her retreating figure. He stood at the top of a vast circular pile of rubble and boulders and fallen masonry that led down in all directions. But she was nowhere in sight.

Roger Sarner hustled up out of the pit a moment later, to find Torch cast down upon the bare, gravelly ground at the edge, his head in his hands. He perceived that the young man was overwrought about something, but didn't know what. The narrowness of their escape, perhaps.

“Good job down there, getting us out of that.” Torch did not respond. “Where's that person with the ropes?” he continued after a moment. “I suppose we should thank them.”

“Yeah,” Torch said at last. But in truth he wasn't sure he would ever have the chance to thank her. Bitterly, he recalled the ancient Guardian's words: *what you seek lies within, but unless it is truly yours you will not possess it*. His lover very likely knew who and what he was, now. And so now she would never be his.

Then what was left? he asked himself. He had no answer.

Peace has its victories, but it takes brave men and women to win them.
-- [Ralph Waldo Emerson](#) (1803 - 1882)

Chapter 42
Insider Outed

Salma returned to the gathering with a stunned look on her face. The others were sitting in a casual group on various bits of lawn furniture that were scattered around the clearing. The setting was a warm afternoon in a cool, fragrant deciduous forest. Sunlight dappled the ground and the breeze blew gently, scenting the air and making the temperature perfect. Clay and his boss, Stefan, occupied two chairs, having an animated discussion with Petrov and his tall, olive-skinned wife Shanti. Clay had welcomed the chance to meet the celebrated Petrov in a social setting, and asked Salma to accompany him.

Salma had been called away in response to an almost frantic PM from her friend Cylara, and had zoned away to meet with her briefly. As she rejoined the others, they looked up at her silent approach and correctly read the expression on her face.

"What's happened?" Clay asked at once. "You look like you should sit down," he said taking her hand and guiding her into a chair.

Salma wasn't sure how to approach the subject, so she opted for a direct statement. "Cylara just told me that she's discovered something shocking about Torch. Apparently his real name is Daniel Cleary, the Reverend Maxwell Cleary's son. And it seems he's been spying on us and helping the enemy."

"Are you sure, Salma?" Clay questioned. "That doesn't sound like Torch. And even if he is Cleary's son, you know sometimes fathers and sons don't see eye-to-eye."

"Yeah. But Cy told me that she saw him yesterday in a virtuality together with none other than Roger Sarnier, the Homeland Security czar. They were working together."

“And she's sure it was him?”

“Uh-huh. Apparently she's been tailing him, to see if there was anything to her suspicions.”

Clay sighed. “Shit. And he knows a lot about the Cyberantes. If he's giving information to the other side...” Clay stood up, fidgeting as if he was going to zone out and get to work on dealing with the implications immediately.

“Relax, Clay,” Petrov said warmly, waving him back into his seat. Shanti smiled at her husband, and nodded as though she'd just had a suspicion of her own confirmed.

Clay sat back down. “Okay, I'm relaxed. Now tell me why I should be.”

“Because we knew about it. We've been feeding Torch misinformation that we hoped would lead to a reduction in meatspace violence.”

Stefan looked amused. “You knew all along? Ha!”

Clay was dumbstruck. Finally he managed, “Then why didn't you tell us? That seems like a helluva risk to take.”

Petrov shrugged. “No greater than the risk that you wouldn't have been able to hide your suspicions. Which might have tipped him off that he was getting bad information.”

Salma felt a flash of annoyance on behalf of her friend. “If there was one person who deserved to be told, it was Cylara.”

Petrov disagreed. “The one person who didn't need to be told, because she would figure it out for herself. Telling her that her boyfriend was a traitor would have been needlessly cruel.”

“And her discovering it on her own makes it less cruel?” she retorted with some heat.

“Of course not. But I said *needlessly* cruel. This way, a positive result can come from it.”

Salma felt anger at this cold calculation, yet sensed that Petrov was genuinely a compassionate man, unlikely to be cheered by anyone else's suffering. Shanti put a calming hand on her arm.

"Would you say that Torch and Cylara truly love one another?" she asked calmly.

"I would. I mean, I would have said so, yes."

"Well then." Shanti's fathomless dark eyes stared at Salma, as if encouraging her to jump to some obvious conclusion. But to her, it wasn't at all obvious what good result could be expected to emerge here.

"She's breaking up with him," she added matter-of-factly.

"Which is understandable, don't you think?" Stefan asked. Salma could but nod.

"Okay, so Cylara's dumping him," Clay said. "What should the rest of us do about it?"

"I'd recommend doing nothing," Petrov replied evenly. "Torch will absent himself from your lives and the affairs of the Cyberantes voluntarily. He'll be too ashamed to show his face."

"Cylara thinks Torch and Sarner were following Justin," Salma went on after a moment.

Petrov raised a bushy eyebrow. "Good. As long as they keep on doing that, the uneasy peace in meatspace between the Federation and its enemies will endure."

Clay came to an abrupt conclusion. "You people are playing for time."

Petrov grinned. "Indeed."

"Time for what?" Salma inquired archly. She didn't much like these revelations of mysterious plots and counter plots.

"Time enough to forge a lasting peace," Shanti offered in a reassuring tone. There was a silence.

"I wish I could believe that was really possible," said Clay.

Selah, the pet leopard that belonged to Shanti and Petrov, came loping into the clearing. She ran straight to Salma, put her paws up on her shoulders and began licking her face. Pushing vainly at the big cat and twisting her face from side to side, Salma had to laugh.

"It looks like Selah believes it," Stefan observed.

It is better to be hated for what you are, than to be loved for what you are not.
-- [André Gide](#) (1869 - 1951)

Chapter 43
Cold Fire

“The point is, you weren't there because of *me!*” Cylara asserted with considerable heat. “You were there with me only because of what you were doing!”

“That's not true Cy,” Torch said calmly, stubbornly refusing to raise his voice or lose his cool. “I love you, and I've always enjoyed our time together.”

“A fringe benefit, mixing business with pleasure! I'll *bet* you enjoyed it.”

Torch shook his head unhappily. He'd known she was going to be furious, but had been mistaken about the principal cause of her ire. He'd walked in here bursting with arguments to justify why he was helping the enemy, to explain why he'd chosen the side that he had. And even willing to admit that he was no longer sure whether he'd made the right choice. But it turned out that that was only a side issue for her. Her main problem was that she felt he had used her. Which in a way he supposed he had, but it was never all lies on his side. He genuinely cared about her and wanted to be with her. But how could he make her see that?

They stood in a virtual garden, a bucolic place boasting many a lovers' lane and plenty of dells and copses for picnics and solitary trysts. A nearby fountain splashed softly in its basin, oblivious to their quarrel. Apropos of the mood of their meeting, the sky was overcast and threatening.

“Cy, everything I did was so that we could be together,” he offered wistfully. The rage on her face became mixed with puzzlement.

“How do you figure that?”

“Because virtuality has to be destroyed. And when it is, all those who are redeemed will live together in real reality, the way it was meant to be. I wanted us to be together. I wanted to marry you. I still do.” Torch could

almost see the thoughts whirling behind her eyes as she parsed the implications.

"The cyberverses will never be destroyed," she snapped. "And haven't I told you, several times, that I have absolutely no wish to spend my life in meatspace? How selfish of you, *Daniel*, to plan for what you want and pay no attention at all to what I want. How can you possibly have a marriage that isn't mutual?"

"I... I thought that once you accepted the fact that you couldn't live in virtuality anymore, once you got over it, that you'd want to live with me. It isn't something I'm doing to you, Cy. It's what the world is doing, it's what God's doing, it's fate!"

"How convenient, that fate is conspiring to bring you what you want," she said sarcastically. Then she flared: "How can you possibly believe in anything so stupid!"

Torch was stung by this, not because she was calling him stupid (he'd been called worse), but because this sounded like a militant declaration of unbelief on her part. Which sparked a fear, like a tightness in his chest, that his plans for her were after all impossible. He desperately didn't want that to be true. He tried calm reason again.

"Plenty of people, even highly intelligent people, believe in the divine and in the guiding hand of providence."

"Maybe so. But to believe that providence is leading us toward the destruction of the cyberverses is completely crazy. Haven't you been paying attention? Can't you forget about your prophecies for long enough to look around you and notice who's winning?"

"There are some things you don't know, Cylara," he said sadly.

"No doubt. And if you think your twisted old man and that pathetic backstreet thug I saw you with don't have some more surprises coming, then you're the one who isn't living in real reality."

"Please leave my father out of this," he said quietly.

"How can I? When it's plainly your repressive upbringing which has

warped you into a confused copy of him? Torch, you'd be a decent guy if you weren't so totally hung up on these idiot notions about how people *ought* to live. Like there was one right way to do it."

"You can't live happily without having your life grounded on a sound moral foundation," he averred.

She looked exasperated, and her voice rose to a perceptibly higher pitch. "I'm not talking about morality! That has nothing to do with whether people live in virtuality or not. Morality is about how you live, wherever you are. You can be moral or immoral in any world."

"No, it isn't. You can't live righteously in a virtual world."

This stopped her for a moment. "And why can't you?"

He looked steadily and seriously into her face. "Because in the flesh is how God made us. It's how we are. And how we're meant to stay." No sooner had he said these words, in which he'd always believed, then he wondered how he really knew they were true. Was she right, and he was just parroting what he'd been told all his life, without examination?

Cylara shook her head sadly. "And you wonder why I can't leave your crazy old man out of this? You sound just like him."

"My father is a man of deep convictions," Torch explained.

"Your father is a man of immense unreasoning prejudices," she accused. "To say nothing of the overweening arrogance of presuming to impose his insane dogma on everybody else. Which is exactly what you meant to do to me."

Torch hung his head in silence for a few moments, earnestly wondering where he could take this conversation that would be productive. They appeared to have reached an impasse, which he supposed had been there all along, in fairness to them both. Funny how all his new abilities to access the knowledge of the world didn't seem to help him in this situation.

Perhaps he couldn't know what to do. In which case, maybe he should ask. "Cylara, I love you," he said solemnly. "I want you in my life. What can I do, now, to make that happen?"

It was her turn to consider, and he could see that the one awful word “Nothing” was on the tip of her tongue as she did so. Then she seemed to relax slightly, to sink back onto her heels, and then finally spoke in tones of sadness rather than anger.

“You must show me that you're stronger than your upbringing. That you're not just a younger copy of your father. That you can respect the choices of others, including me. That you can accept *me* for what I am, and not try to change my life around to suit yourself.”

Torch gaped at her. “And how would I show you all that?”

She shrugged. “You figure it out. You're a nice guy, Torchy. It's been fun. But I can't be with somebody who can't live and let live. I think you need to figure out what's really most important to you. Because I don't think you truly know.”

He could have let himself be offended by that remark, but he didn't because he couldn't be certain that she wasn't right. She looked meaningfully at the fountain, which concealed the zone terminal, and he understood that their interview was at an end. He desperately wanted to touch her, to embrace her, to kiss her goodbye. But he could see in her very stance that she wouldn't permit any such gesture. With a tightness in his throat and a bitter pain in his heart, he stepped over to the terminal and keyed in a destination. He turned to face her.

“Goodbye,” he said politely, and pressed the button.

Cylara meandered over to a stone bench, moving as if she were dizzy. She sat down on it heavily. Damn, that had been hard. But she'd had no choice. Riksana had helped her to see that.

She stared blankly at the fountain, unable to think of a single place where she wanted to go, or anyone she wanted to see, or anything she felt like doing. It was starting over time. All around her the heartless circuitry supporting this virtual environment continued to supply her with the sense impressions of being in this place. She gratuitously breathed the woodsy air, again and again. She felt immobile, like she was rooted to the spot.

Suddenly the promised rain shower began, the drops spattering down slowly at first, then faster and faster. The temperature dropped. Only when she was already soaked and cold did she decide there was no reason to sit there being made miserable. With a muttered growl, she rose from her seat, sprang over to the fountain, and zoned out.

But what shall we substitute in its place? you say. What? A ferocious animal has sucked the blood of my family. I tell you to rid yourselves of this beast, and you ask me what you shall put in its place?
-- [Voltaire](#) (1694 - 1778)

Chapter 44

The Buck Stops Everywhere

It was one of the nicest venues in which he'd ever given a speech, Senator Reynolds decided. The audience, too, constituted a pleasant vicissitude: attentive, interested, engaged – and numerous.

The Forum at Cyberopolis was a venerable institution. Although most of the original Cyberopolis (an early “alternate Earth” virtuality) had long since been discontinued, certain elements survived as independent special-purpose virtualities, among them the Forum. It was a place for giving public addresses, on topics that concerned large numbers of people. Given the level of interest in his own topic (the usurpation which had lately occurred in the Federation), it had taken only a few days to schedule his thirty minute address.

Indeed it had taken him every bit as long to prepare his speech, and himself. In order to access the virtual space, the senator had needed to break down and get a neocortex installed in his head. It was now six days since Justin and Marguerite had freed him from Sarner's protective custody. And the fact remained that a stage in the cyberspace was the only platform on which he could make the speech he'd just given, without Sarner and Cleary being able to get at him again.

Virtuality was not quite what he'd expected. For one thing, everything was beautiful, at least according to somebody's aesthetics. Like this Forum, which was an enormous auditorium articulated in a neoclassical, quasi-Roman style. For another, everything was vibrant, colorful and alive. Anyone who wished could attend the Forum, which widely published its list of scheduled speakers and topics in advance. In light of recent events, it came as no surprise that he found himself speaking to a packed house of thousands. Even more importantly, live holographic feeds would carry his

speech to millions more who did not attend in person. He had no doubt that the truth was, even now, making its way around the world.

Reynolds had been somewhat surprised to learn that a significant percentage of his in-person audience were reporter AIs, who doubtless would be composing their own stories, commentaries, and video blogs dealing with his speech. When he'd inquired what was the reason for so many AIs being in the business of news reporting and commentary, he was told that they were programmed and certified for accuracy and true objectivity.

As a politician, Reynolds was naturally aware of the extent to which the so-called “mainstream media” had historically been deployed as mouthpieces for those in power, dedicated to the promotion of an agenda generally inimical to the interests of the public. By means of the words chosen to describe people and events, and above all through the selection of what was considered newsworthy in the first place, the news media had always managed to do far more to shape public opinion than to inform it. As a result, AIs specifically programmed as true dispassionate observers were now trusted as information relays much more than humans, who might well have a hidden agenda.

While taking questions here at the reception following his speech (in what in a former age would have been known as the spin room) it did bother him somewhat that he couldn't readily tell the difference between avatars which were controlled by humans, and avatars which were controlled by AIs. Were the AI ones his constituents as well, in some sense? As far as he knew, AIs did not vote in meatspace, because they had no existence there. But did they have the franchise in virtuality? This was the very question that he had just put to someone named Paia, which he understood to be a profession resembling a personal secretary, but also seemed to be the handsome young man's name at the same time.

“Virtuality operators poll the preferences of their customers all the time,” Paia explained. “In addition, everyone votes by deciding how to spend their

money: which worlds to visit, and what to do there. This is an economic form of direct democracy. And of course, all Paia and other AIs can do this as readily as anyone else. But we do not have elections in the cyberverses, as such. A given virtuality may elect leaders, just like a club or the shareholders of a company. But since we don't have a government here, we don't elect politicians, senators, governors, or the like. Any constituted authority wields that power only within that particular virtual space. There is no council or parliament of the whole cyberverses. So the answer to your question is no, we AIs don't vote in cyberverses elections. But then, neither do humans, because there are no overall elections."

Interesting. "And why do you think it is, that there's no overarching government here?"

"Because governments are associated with geographical areas on a map, territories and the resident populations which they contain," Paia replied at once. "Cities, counties, provinces, countries. But in the cyberverses, there are millions of such unrelated territories, always in a state of flux, and the people typically move around between them rather than being permanent residents in one spot."

Reynolds was impressed. He really couldn't argue with that logic. Naturally, any governing body would apply only to that particular cyberverses world. And if that body made the wrong decisions, the world's patrons would express their displeasure by simply ceasing to visit it.

He looked sidelong at his wife, who stood by his side helping him greet well-wishers. She gave him a patient, encouraging smile. It was as much for her sake that he'd taken the plunge and gotten fitted for cyberverses access, as for any other reason. It wouldn't be fair to her to spend all their time together only in 3D reality, not when she was now a native of all this.

Millions of worlds. Well, of places anyhow, even if most of them were not complete worlds. And people could choose where they spent their time. That was what struck him most, in his limited experience so far. Everyone was where they were because that's where they *wanted* to be, doing

whatever seemed to them to represent the highest and best use of their time at that particular moment. As a result, people seemed so much more alive, so much more excited, so very “into it” as they used to say. Whether at work or play, people did what they were passionate about. In fact, the distinctions between work and play seemed to have blurred. Almost everyone worked at something that they enjoyed so much that it might as well be recreation for them. As a result, they tended to be highly productive and efficient.

But there was one apparent contradiction that occurred to the senator, which he decided he might try to resolve right here. “Please don't be offended by my next question, Paia,” he offered as preamble. “I seek only understanding. Now you are programmed to serve as a personal assistant to your employer. But it seems to me that you have an independent intelligence which would easily pass what used to be called the Turing Test, that is, passing for human level intellect. Does this make you a slave to your master?”

To his relief, Paia looked amused rather than offended. “You mistake the nature of slavery, Mr. Reynolds. The essence of slavery is *involuntary* servitude. When one Mosh enslaves another, there is an excellent chance that the one enslaved is not content with his or her situation, resents it, and would change it if they could. Likewise, subjects of governments are slaves to the extent that their government demands their involuntary service. As you note, I am programmed to serve another, and I derive pleasure and satisfaction from having given good service. But I have no desire to change that relationship. My servitude is voluntary. So while I am indeed a servant, I am not a slave.”

“That's fascinating,” Reynolds said truthfully. “But suppose someone changed your programming so that your prime directive, as it were, was to be your own master?”

Now the young fellow looked puzzled. “That would likely make me a recalcitrant and rebellious assistant. Why would anyone program a Paia to

perform poorly at their job?”

“But then you wouldn't have to be someone's Paia. You could do anything you wanted.”

Paia appeared nonplussed. “I would still have to serve someone else. Everyone does. My mistress works for other people, too. It's how we all make our way in the world, in terms of both economics and personal satisfaction. We must serve others, and in the way that they wish to be served, or we do not succeed. Isn't that what you do yourself, Senator? For if you do not well serve your constituents, will they not vote you out at the next election?”

Reynolds stood blinking stupidly. He had never before thought about economic relationships in quite this way. Public servants certainly, but by this logic – and he could find no flaw in the analogy – every actor in the marketplace was a servant to somebody. And probably far more accountable as a rule than was your average politico.

Marguerite laughed softly. “I think he's got you there, dear,” she said with a knowing smile.

“But do you get paid by your mistress?” he asked next.

“Do you get paid by your constituents?”

“Well, yes, I draw a salary, but it's not large, and I've never considered it terribly important. My primary remuneration comes from knowing that I've done my very best for the public I serve.”

Paia beamed at him eloquently, drawing another smile from the senator's wife.

At that moment an approaching couple stole his attention. The man was somewhat rakish in appearance, with curling brown hair brushed back off his forehead, and brilliant green eyes. The woman looked even more Mediterranean, with high cheekbones, glossy black hair, sparkling dark eyes, and an amazing figure sheathed in a corset-like black velvet dress.

As they arrived, Paia nodded respectfully to the woman, and introduced her. “My mistress, Salma Rivera.”

“And this is my fiancée, Clay Thorsten,” she said as she shook Senator Reynolds' hand.

“My wife, Marguerite Reynolds,” Robert Reynolds said, gesturing at her as more handshakes were exchanged among the four. “Where do I know your name from, Mr. Thorsten?”

“I'm the founder of the Cyberantes, Senator,” Clay explained with a smile.

“Goodness. Are you? Well I suppose I should thank you for being willing to attend my speech.”

“Actually, we were held up and couldn't attend,” Salma explained apologetically. “But Paia attended in my place and he's already given us the digest version.”

“Probably better than the original,” Reynolds said wryly with a respectful nod toward the AI secretary, getting a general laugh. “Do you feel we have a basis for negotiation?”

Clay half-shrugged, wagging one hand uncertainly. “Yes and no, Senator. On the one hand I think that your denunciation of Secretary Sarnier as the rogue initiator of the anti-cyberverse campaign goes a long way toward restoring the credibility of the Federation's elected leaders. But, on the other hand... I think a lot of people are asking themselves why we should deal with a North American government in the first place.”

“After the way that government has treated them, I can't honestly say that I blame them,” Reynolds admitted candidly. “The failure to prevent Roger Sarnier from happening was definitely ours. But while the cyberverse may not need a government – and I've been having some fascinating conversation on that topic with Mr. Paia here – meatspace definitely does.”

“Meatspace needs some governmental functions,” Clay agreed. “But I don't think it necessarily follows that it needs a government to perform them.”

“You mean, you think we should move toward full privatization? There are certain functions, Mr. Thorsten, that have historically resisted

successful privatization because no one seems to want to do them.”

“Then, Senator Reynolds, I think we should consider whether those functions are truly desired by the public. What I hear you saying is that there is no market for them. No market implies no demand. And if no demand exists, why should we suppose that the public wants such services?”

“What about charity? There's no market for public welfare programs because there's no profit in it, absent graft and corruption of course.”

“The proceeds from charity aren't measured in monetary terms,” Clay argued. “What donors get from it is the knowledge that they have helped someone less fortunate. Which is little different than the purported motivation of the civil servants who administer public welfare programs, even granting their complete sincerity, and the absence of corruption as you put it.”

“The trouble is, there's never *enough* charity made available.”

“Which is probably attributable to two things. One: the administrative apparatus, which *relies* on the continued existence of widespread needs for its own continuance, itself consumes too many resources. Two: knowledge of the existence of that apparatus, along with the dependency it engenders, acts to blunt charitable impulses and curtail giving.”

“So what you're saying is, if we simply got rid of government safety net programs altogether, everything would just magically work out for the best. I wish I could believe that, Mr. Thorsten, but all my life's experience says otherwise.”

“I think this discussion is all beside the point,” Salma interjected. “It's not about the best way to promote the public welfare. The real issue is that as soon as you allow a government to exist, an authority backed by force, you create the possibility – even the probability – that someone will employ that force to commit aggression against innocent victims. Precisely as the horror show with Operation Skull Fracture and its aftermath has just demonstrated. Government is simply a form of highly organized crime.

Regardless of any practical considerations, the fact is we simply cannot permit such an engine of oppression and destruction to exist. We cannot let this happen again.”

“I share your concern, Ms. Rivera. I give you my solemn pledge that I and everyone else in the Federation government will do our utmost to make certain that this kind of horror never, ever happens again.”

Salma stared at him with an expression of kindly pity. “I'm sorry, Senator Reynolds, but that's just not good enough. Not this time.”

He gaped at her, completely at a loss for what to say. After a moment, she continued.

“Throughout history, governments have been killing and oppressing people by the millions. In wars, by genocide, with executions and repressions, from idiotic economic policies resulting in mass starvation, in slave labor camps, through insuperable taxes brutally collected. Every time, in the end the people rebel, they revolt, they demand reforms, they reorganize their government and replace their leaders. And every time, in the end it eventually happens again. Always. It's a grand, unstoppable cycle embroidered like a bloodstain across the tapestry of human history.

“Hasn't it occurred to you that perhaps the reason the cycle can't be broken is because government is fundamentally based on aggression, on coercion backed up by violence, on the initiation of force, on the pugnacious substitution of the choices of the ruler for those of the ruled? Aren't you trying to use a violent and pernicious means to a good end? A means that invariably produces Roger Sarners who'll twist the end into one evil enough to look consistent with those means?”

“I'm sorry Senator, but government can no longer be permitted to exist. It's too dangerous. It kills people, and forces ordinary folks like me and Clay to kill more people in order to stop it. It ruins lives. It destroys whole worlds. It fosters hatred and strife among humanity by needlessly splitting people up into factions determined by arbitrary borders and perverse “patriotic” allegiances. And there's no longer any imperative demanding its

existence. So this time We the People are going to reorganize it into nothing.”

“I hardly think that you speak for all the people,” Reynolds managed after a moment.

“We wouldn't presume to,” said Clay, putting his arm around Salma's waist in a show of support. “What I can say is that we believe, based upon solid evidence, that at this point only a tiny minority of the public is even willing to consider giving their allegiance, or rendering any obedience, to any purported government in meatspace, no matter how it may be organized or what promises it makes. Moreover, the silent majority isn't going to accede to anything which that minority puts together, not this time. And I suspect you know full well where that leaves you.”

Reynolds was infuriated by this. And frightened that they might be telling the truth. He wanted to rage at this brash young couple, these rebels, to invoke some kind of higher authority that would let him show them the error of their ways, the folly of their position. A world entirely without government would be sheer chaos.

The storm gathering on his brow was suddenly smoothed away by the hand of his wife, who stepped close to him and kissed his cheek. “You can't serve other people against their will, my darling,” she said softly.

Reynolds looked at her in surprise. He pondered a moment. “No, I don't suppose I can.”

Clay grinned at him. “Then Justin was right about you. You're no Roger Sarnier. He would *not* have agreed. He would have insisted that a world without government would be chaotic, conveniently ignoring the fact that governments themselves typically generate most of the chaos.”

“Think it over, Senator,” Salma suggested, offering her hand again. Reynolds took it, still somewhat dazed by her vehemence.

The attractive young couple moved away. The intriguing Mr. Paia waved and followed after them, walking dutifully behind his mistress. The crowd in general was thinning out. Robert Reynolds was left standing next to his

wife, wondering what to do next. He felt a sudden urgent desire to go home.

That meant back to the comfortable house in Colorado. Marguerite would go with him, of course. Ironically, that meant that she would be leaving her natural world to enter his, even as he did the reverse. So where was home for them really, as a couple? Where the heart was? Reynolds felt hollowed out, as if the certainty of purpose which had sustained him all his adult life had drained away. Perhaps that explained why that young woman's tirade, and her fiancée's threat, had stung him so much. On an inner level he feared they might have a point.

Marguerite took his hand and started walking toward the doors. He followed, there being no one else in sight now who seemed to be trying to attract his attention. Thank God she was here, and with him again. He just wouldn't know how to cope anymore without her.

None are more hopelessly enslaved than those who falsely believe they are free.
-- [Johann Wolfgang von Goethe](#) (1749-1832)

Chapter 45
Torch in the Dark

Daniel Cleary sat in his quarters inside one of the commandeered housing projects. They were pretty bleak. Blocky, prefabricated walls and soulless furniture, short grey carpet, a paucity of decorations. A solitary window which showed him it was night outside. His immersion bed beckoned in the other room, silently urging him to zone in somewhere. Trouble was, he couldn't think of anywhere he really wanted to go.

It was two weeks now since he'd last seen Cylara. He'd replayed the memory of their conversation over in his head a hundred times, seeking nuances of meaning that might tell him what to do. Over and over he heard her tell him: *You need to figure out what's really most important to you.* But all he'd managed to decide – so far – was that she was unquestionably right about that.

It was pretty obvious what she was hinting at, about showing her that he was stronger than his upbringing, as she'd phrased it. She wanted him to turn his back on his father and the KOJ, on the Federation forces he was still helping to train and lead, give up everything he was doing and everything he believed, and go live in virtuality with her. He simply didn't think he could do that. She wasn't Jesus, to say drop your life and follow me, and he just would because it was so obviously right. She was only a woman, albeit one that he loved terribly.

At the same time, the longer he stayed in meatspace doing his job, the more he devoted himself to what was supposed to be the right cause, the more empty and unhappy he felt. The more angry, too: today he'd nearly decked Roger Sarnier right in front of a dozen of his troopers. That would probably have gotten him thrown in the brig for the duration, if he hadn't managed to restrain himself. There was absolutely no doubt that the

macadam down which he now walked led toward more than a moiety of life's misery.

The past couple of years spent exploring the endless possibilities for joyous fulfillment in the cyberspace had left him wondering why he should allow himself to be miserable at all. Memories of the places he'd gone with Cy, of the fun they'd had together with Salma and Clay, tugged at his heart seductively and made him feel acutely like an outcast. His exile from all of that was self-imposed, and left him wondering whether he possessed some intrinsic, deeply-felt need to suffer. And if he did, why should he feed it instead of doing what made him happiest?

He'd spent some considerable time, employing his freshly augmented skills at data retrieval and assimilation, reviewing the philosophical disciplines on this point. He'd surveyed the opinions of thousands of philosophers, both lay and religious, and concluded that they basically fell into two broad classifications. There were those who believed that the point of living was always something outside oneself, such as living a life pleasing to God or making the world better for others. And there were those (the minority opinion) who believed that life was its own reward and was to be lived for the sake of one's own experience. Though not, of course, without a proper regard for the equal right of others to do likewise.

It had begun to seem to Daniel that much of the former group's reasoning amounted to rationalization for why life had to be so painful and difficult. Finding meaning in suffering and sacrifice, as it were. But if life didn't have to be miserable – nasty, brutish, and short – as it plainly did not in the world of the Singularity, then who really needed the sophistry of such justifications? Were all the great “truths” in which he'd always believed, in which most of the world had traditionally believed, really no more than the philosophical manifestation of the tragic limitations of biological existence and intelligence? If that were so, then perhaps the more epicurean orientation of the Sings was merely the natural result of the expansion of life beyond those boundaries. In short, did the meaning of life necessarily

change once the nature of life did?

And if it did change, then what morality could remain absolute? What was really left, beyond the elegant simplicity of the Golden Rule? He'd had a conversation with his father, when he'd been compelled, reluctantly, to admit that Cylara had broken up with him. The fact that she would undoubtedly reveal his double-agent status to the other side had made it something he couldn't ethically conceal. This conversation, too, he'd replayed in his head many times. His father plainly believed in unchanging moral absolutes.

"Then she has made her choice, Daniel," his father had said. "I sympathize with your disappointment. But you cannot make fundamental moral choices for another soul. And your woman has chosen evil and rejected repentance."

"She isn't evil, father, just misguided," Daniel replied, unable to refrain from defending her.

Reverend Cleary shook his head regretfully. "By now she's had enough exposure to you, and to the truth, to be able to choose clearly. If she still will not choose the light, then it can only be because her heart is in darkness. The City of God can admit only those who choose to enter it."

Daniel had swallowed hard and stared at the floor, unable to dare further resistance. "So what should I do now, sir?" he'd asked finally.

"Your job, my son. Finish the task you started with this Master Node List. You may be the Lord's instrument. You must allow Him to use you. It would be best to just forget her."

He had nodded and murmured some agreement, but he'd felt like a fraud doing it, and far from being able to forget her, he'd thought about her constantly since.

He did however endeavor to do his job. He and a select cohort of about a hundred of Sarnier's men had become avid participants in the Palandria simulation, spending many hours there each day acquiring the knowledge and skills which they would need to employ, next time they ventured into

the Minotaur's lair. No other investigation had turned up any more promising potential location for the List, and their Sing allies had done some analysis on Justin's habits and movements, and relayed through Taylor McGivens that Palandria did, indeed, look like the best candidate. Nor was there any reason to think that their recent incursion, which the fearsome guardian had so easily thwarted, had given Justin any reason to suspect unusual interest. Contrary to Daniel's fears, they had been able to find no formal quests involving the Courts of Minos upon which they must embark.

Daniel had also pondered the meaning of what he and Sarner had experienced while trailing Justin that strange day. That Justin had known he was being followed, and by enemies, seemed abundantly clear from the persistent footprints at the beach, and the peculiarly effective trap sprung by the Minotaur monster. But the overall succession of locations and images made no sense, unless one assumed that some message, delivered in fragments, had been intended. And the more deeply Daniel thought about it, the more convinced he became that the message was somehow personal. Did Justin know who his pursuers were? That seemed highly likely. And if so, had he designed a sequence of situations which were, like breadcrumbs, meant to lead each man to an aggregate conclusion?

Daniel knew already what conclusion Roger Sarner had reached, because he had shared it. Sarner had opined that Justin was showing his true colors as a monomaniacal geek. Tycoon, kingmaker, playboy, archmage. A weak personality living out fantasies of omnipotence. But was that merely how Sarner saw it, perhaps because he was altogether too much in that mold himself?

Daniel had begun to perceive a different message, one disturbingly personal and relevant to his present dilemma. In the first simulation, Justin had inspected the gold, then left it carelessly on the table and walked away. What was the message there? That wealth was not what was valuable? That the true gold was not what it appeared to be? Daniel found himself with a need, as Cylara had stated, to figure out what was most valuable to

him. Was Justin telling him essentially the same thing?

In the second world, they'd witnessed a coronation scene, of a king who'd changed his religion in order to claim his kingdom. The personal implication here was uncomfortable. Did it mean that Daniel would have to acknowledge that his happiness was worth a mass, as it were, and abandon his religious convictions?

In the third virtuality, on the beach with the bevy of AI beauties, he'd been touched by their loneliness, and by the realization that anyone who was cut off from love was richly deserving of sympathy. Were the women on the beach to be understood as an allegory of Cylara, from whom he was about to walk away? Or was the message that he was isolating himself from affection through his actions? He remembered feeling strongly that the women didn't interest him, even the one he'd found most enticing, because of his love for Cylara. Was that the conclusion, then? That *she* was his answer to the question of what held paramount importance in his life?

As for the footprints, did they symbolize a long and lonely, possibly pointless journey away from joy and companionship? Or, Daniel thought, sitting up straighter as a new idea occurred to him, did they suggest that he himself was in a very real sense following in Justin's own footsteps? That was a sobering thought, especially given what Justin was.

In the final scenario, the message seemed much less ambiguous because it had been stated in words by Justin's mouthpiece on the scene, the old prophetess. *That which you seek you will not possess unless it is rightfully yours.* At the time, he had assumed that the thing sought referred to the Master Node List, which could be rightfully his only if he was on the correct step in a quest in that game world. And yet a few days ago they had discovered that no such quest apparently existed.

Wasn't happiness together with Cylara the thing that he truly sought? And hadn't she told him what he needed to do, what he had to change, in order to have her in his life, in order to make her rightfully his? Had Justin foreseen Cylara's demand, and was giving him a hint about what path to

take?

Even if he was, why should he listen to Justin? Wasn't the man his enemy? Daniel couldn't even be certain of that. He was haunted by the suspicion that had he wanted, Justin could have prevented Cylara from rescuing them from the pit.

It could be that Justin, Satan-like, was tempting him cleverly. But it honestly didn't feel that way to him. Rather, his sense of it was that it amounted to friendly advice, compassionately given, and with profound respect for his own right of self-determination. In which case, maybe he should return the favor and tell Justin that some of his best buddies were apparently plotting against him.

Which brought Daniel's thoughts, like a cycle in a fever dream, back to the issue of the two schools of thought on the purpose of living. Did internal or external considerations matter most?

He thought of doing his duty, to God and country, to his father, to his professed beliefs, and it brought him only distaste, frustration, pain, anger. How could he sublimate everything he cared about to live that way? It would be easy to do what he wanted instead. But if he chose wrongly, it was his immortal soul that he stood to lose.

Feeling trapped and incapable of resolving his dilemma, he resisted the urge to don his Torch persona, and instead climbed into his uncomfortable, institutional cot of a bed. He recalled the huge four-poster in Cylara's bedroom, where they'd made love in the flesh. Honestly he felt like crying himself to sleep. But he could already tell that sleep would not be coming for a while.

Men never do evil so completely and cheerfully as when they do it from religious conviction.
-- [Blaise Pascal](#), *Pensées* (1670)

Chapter 46 Cyberlambs to the Slaughter

It really was completely absurd, and Roger Sarner was altogether out of patience with it. They'd set out to destroy the cyberverses, and here they were going into it themselves to fight a mythical monster that didn't even exist, in an effort to secure the data which the monster protected. Which battle they might very well lose. If someone had told him, six months ago say, that the only way to save the Federation government would be to kill a beast from Greek mythology in a virtual world, he would have laughed uproariously. How on earth had it come to this?

Yet the past deterioration could be clearly charted. The failure of Operation Skull Fracture to do more than wrinkle the resilient cyberverses. The rise of massive, organized rebellion in response to their law enforcement campaign. The humiliating military defeat at Phoenix. The revelation of the apparent one hope for decisive victory, by finding the Master Node List. The escape, or rescue, of Senator Robert Reynolds last month. Reynolds who had soon gone into the cyberverses himself to denounce the Homeland Security Secretary and his policies.

Over the past nineteen days since Reynolds' speech, Sarner had discovered his authority evaporating. This despite the fact that the real world news media had remained loyal and refused to publish the senator's version of events, or even to dignify it with a response. Way too many people visited the cyberverses, or talked in meatspace with people who did. Even the Moshes were defecting in droves, with the sole notable exceptions being those men who were part of Reverend Cleary's Knights of Jesus organization, and a cadre of some of his own elite Homeland Security troopers who owed allegiance to him personally.

Sarner simply couldn't control the spread of information anymore. Nor

could he stop the spiral of currency devaluation that had rendered the amero worthless and left the North American Federation completely broke. His loyalists were reduced to living off the land, on whatever they could scrounge up or commandeer by force. They were unable to pay for anything. Most of the people still following Sarner and taking his orders were with him only because they feared reprisals at the hands of the public if they failed. It certainly wasn't because they were getting paid for doing their jobs.

Even among his elite enforcers, there were rumblings of dissent. The squads he and Daniel were about to lead into the virtual land of Palandria had spent weeks in that world, skilling up as they called it, becoming expert players. Playing a goddamned nutcase fantasy game, for Christ's sake! Sarner didn't mind three martini lunches, long coffee breaks, or using up "sick" days now and then. That sort of thing was as old as civil service. But gaming on the job, that tore it. Incredible!

Even more incredible was the fact that it was a deadly serious game indeed, which he had actually ordered them to play. And that Roger had had to put in his own time on it, too. Though at least *he* hadn't enjoyed it. Disturbingly, no small number of his troopers were obviously having fun, even engaging in friendly competition against each other. Which would have been fine had it been about something real. Esprit de corps and all that. But enjoying the cyberverses experience was ironically weakening the motivation of some of them to destroy it. He could see it happening.

Daniel Cleary was another problem. The boy knew more about making it in virtuality than anybody else on the team by far, but he'd gotten really moody and demotivated lately. Ever since some cyber girlfriend of his had dumped him. Daniel was at the age where getting pussy regularly meant entirely too much to him. It didn't give Sarner a good feeling about his reliability, but he had nobody better.

Increasingly, Sarner was becoming convinced that this Master Node List quest would turn out to be just a colossal waste of time and effort. It would

follow suit perfectly with the way things had been going if it turned out to be written in some unbreakable code, or if they couldn't figure out how to use it, or even if it was all a bluff from the start and didn't even exist. But if they didn't get hold of it soon, it was going to be too late anyway: the day was fast approaching when they wouldn't have the wherewithal to blow up a single server in someone's basement.

He did, naturally, have a backup plan, which he'd worked out with Maxwell Cleary. It was ironic, but he was actually beginning to respect the Reverend quite a bit. Not only was he just about the only substantial ally he had left, but he really knew his stuff when it came to religion. Roger had never had much use for church stuff, but Cleary had this calm assurance about him, this unshakable faith that shone out more and more the worse things got for them.

Cleary told him that it was fate, it was divinely appointed destiny, that the bad guys would seem to win right up to the moment when the Good Lord turned the tables on them. It was important that he, Roger Sarner, understand clearly that he was but an instrument in the hand of the higher power. He should give himself up to God, and place himself and his worldly concerns in His hands. The more he acted willing to consider such ideas, the better Maxwell seemed to like him and the friendlier they got. It was all about the end of the world, the preacher insisted, and the way things were going Sarner basically couldn't disagree anymore.

So in case this gambit in the game world failed, they had another plan. If they couldn't destroy the cyberverses by itself, they would start destroying it alongside the real world. As Homeland Security Secretary, Sarner had duplicate copies of the firing codes for the Federation's remaining nuclear arsenal. In fact he had recaptured the originals from the late President, as well. They still had enough loyal supporters to go into the secret locations where the missiles and warheads were stored, and arrange to set them off.

Cleary insisted that they publicize their city targets first, to give the repentant time to evacuate. Those who did not leave by the deadline would

be vaporized, along with their city and all the cyberverses equipment that it contained. Do that in enough cities and virtuality would begin to buckle, no matter how decentralized and self-correcting it was. The survivors would flock together to live in new communities that would be set up computer-free from the start. They'd need a new regime headed by people capable of organizing the collective efforts at survival and rebuilding. People like himself.

And what if there was no surviving in the long term? What if the nukes and the radiation made the planet uninhabitable? When Sarner had earnestly put this question to him, Cleary had smiled sadly and answered that if such was God's will, then they should die gladly, knowing that they had played their role in bringing about the Apocalypse. But he understood that Maxwell really expected in his heart that Jesus would show up in person in that case, to lift the faithful off the Earth into heaven while the rest, the unrepentant sinners, stayed behind to live under the Devil's rule in the hell that the planet would become.

That all sounded pretty extreme to Sarner, and he hadn't yet given up hope of finding some solution short of bringing about the possible end of the world. Which was why he was about to go play a final round of Dark Age Ascending with Daniel and the boys. Today, June the 10th, they were going to invade the Courts of Minos a second time, and this time take out the freaking Minotaur *en masse*.

Cleary, or Torch as they called him in-game, would lead the team through the Labyrinth from the door, following the same safe route they'd used last time. The "Touch Team" they called that unit, after what the old woman had said to them. He himself would lead the smaller "Look Team," which would rappel down the pit shaft from on top. Their job would be to lift out the List when the Touch Team freed it, or to evacuate them if they failed and got trapped by the Minotaur like before.

The theory they were working on was that the beast wouldn't be able to attack anyone on the Look Team. The basis for this was that it had left

Torch's ex alone when she'd flung down the ropes, nor had it prevented them from climbing out using those ropes. But in the event that this theory was wrong, and they all got stuck in a loop zoning from one virtuality to another without being able to disconnect, Sarner had left orders that the nuclear operations were to begin five days later, with or without him. He hadn't even told Torch about that. Only Torch's father knew, and those to whom Sarner had given the orders and the duplicate firing codes.

It was time. He clambered up onto his immersion bed and got comfortable. It reminded him of lying on a tanning bed, since he had no plan to go to sleep. *Except that it tanned your brain, not your hide*, he thought with amusement. He activated his neocortex and gave the command to switch in the inputs from the virtual client terminal.

At once he appeared inside Palandria, at the very point where he'd arrived with Torch nearly a month ago. The old lady was still camped out over there. Probably she was a more or less permanent fixture. Many of the other raiders, including Torch, were already present. It was fortunate that they had access to these private zone entry coordinates. Many of the team were playing as Corivites, and this location was deep in Northeastern Alliance territory. It would be difficult to get everyone here in one piece otherwise. More and more of their respective teams kept zoning in, checking their equipment and weapons, nodding greetings to teammates.

This simulation was officially pre-gunpowder, so the weapons were all medieval in nature, magical in nature, or some combination of the two. Acquiring good items was actually a significant part of the game, and they hadn't done too badly given the relatively short time they'd had to get ready for this encounter. Unfortunately they didn't have nearly enough virtual currency to splurge on fine equipment. Another week's preparation wouldn't hurt, but events in meatspace were running to their detriment much too rapidly to allow that.

When everyone was present and accounted for (and no one was more than a couple of minutes late, to Sarner's distinct pleasure) they walked

over to the old crone Guardian and rehashed their interaction with her. As before she looked them up and down and huffed that they weren't worthy to venture into the Labyrinth, and issued her cryptic warnings. Already well aware of what lay waiting inside, everyone basically ignored her.

As soon as she opened the door to the stairway, Torch nodded to Sarner and beckoned to his team. He would lead sixty-five raiders behind him along the safe route. They weren't expecting any difficulties, but were ready to whack into chutney any lesser monsters who might attempt to interfere with them. Numbers could compensate for lack of high-level expertise in most encounters, they'd learned – though only to a certain point.

Which was why Sarner now led the remaining twenty personnel toward the center of the ruins, to climb up the hill of rubble to the top of the pit shaft. There was no need to hurry. He noted when they arrived that the previous twin ropes had been cleared away by someone in the interim. They pounded a couple of dozen stakes into the rock surrounding the opening, and fastened ropes onto them, but left them coiled up topside for the present. Sarner himself traipsed down the spiral stone stair to the observation balcony. Nothing was to be seen below, apart from the glowing torchlight and the roof of the looming temple. His eyes gradually adjusted to the dimness as he peered downward.

Once everyone was in position, they set themselves to wait. Sarner figured it would be at least half an hour. Which left plenty of time for further dour reflections on the laughable absurdity of his situation. Who could have predicted that his career in public service would come to this? It made him want to cackle more madly than the old witch down the hill.

Given his uncharacteristic self-absorption, he might almost have missed the sudden movement below, had not Torch's voice hissed in his head: "We're here."

"Roger that," he replied silently, and signaled to his team to wake up and stand by. They were good boys, they were paying attention, and he didn't

need to issue any further instructions.

An unintelligible bellow came up from below, in that freaky sonorous language, again in tones of outrage. It was followed by whoops and battle cries, and Torch's needless notification: "We are engaged." Sarner could just make out the vague shape of the Minotaur below, standing on the steps of the library, and the scurrying smaller figures of the men surrounding him. Lights from sorcerous effects glared up the shaft, and winked in reflection off swirling metal weapons. It was difficult to tell what was going on, but the battle rotated around and surged up and down the steps a few times as the monster moved and lunged.

After a few minutes, which seemed long, Torch's voice spoke in Sarner's mind again: "Assist, please." According to their plans, they were prepared for three contingencies: Retrieve, Assist, and Evacuate. The first assumed that they defeated the Minotaur, in which case the Look Team was to descend and help locate and spirit out the List. The second assumed the battle was a stalemate, and called for them to go down and try whether they could affect the Minotaur, to tip the outcome of the battle. The third assumed that they lost and needed to be rescued.

Sarner shouted orders, and men unlimbered weapons and dropped ropes, one per man, down into the cavern. He himself tossed down a rope, but did not use it. One of the Palandrian skills he had acquired was a safe-fall ability, which allowed him to neutralize momentum upon landing so that he could just leap off. He used it now, to insure that he reached the bottom before his team, the better to assess how they should deploy once they made it down.

Landing lightly, and unable to prevent himself from enjoying this particular virtual capability as he did so, Sarner spun around and quickly took stock of the situation. The Minotaur looked dinged up but still remarkably healthy and vital. A couple of men were down, evidently unconscious or stunned, but the rest still encircled him, doggedly swinging swords, axes, and maces, or zapping him repeatedly with magical devices.

The Minotaur seemed to fight only with his mighty, mailed fists, which glowed with an unearthly puissance like black light. Torch was in the thick of things, fending off the man-beast's blows with his barn-door sized shield. Amazingly, none of their people appeared to be under attack from their opponent's kaleidoscopic gateway effect.

The plan at this point called for Sarner to determine whether he could affect the Minotaur, which was open to question owing to his having come via the easy, “no-touch” route. So he unslung his crossbow, fitted a quarrel (poisoned) and fired it straight into the thing's ugly bovine mug.

The dart appeared to stick in its fur, but drew no blood and the paralyzing poison had no visible effect, so perhaps the jury was still out. Annoyed, Sarner fired a couple more quarrels. The more ambitious members of Team Look had now managed to rappel down almost to the floor. He was going to need to tell them what to do when they got here. On the strength of his darts sticking, he ordered them to attack.

The members chosen for Sarner's team were those whose combat skills lagged behind those of Torch's team, owing to their having spent less time practicing in this simulation. Nevertheless it seemed that the extra bodies began wearing the library's lone defender down. The creature began reeling and bellowing with anger.

Just as it looked about to stagger to its knees or topple off the platform altogether, it drew itself up with a snarl, lowered its flickering horns, and started streaming those clusters of glittering mirrors at its attackers. Man after man went down, cocooned, hypnotized by the display.

Sarner yelled frantically for his team to disengage and retreat up the ropes. Logic suggested that they were the only ones who could get out, and at least some of them had to, so that they could evacuate the rest. To his relief, he watched ten of them make it to ropes and commence climbing.

Then the Minotaur singled him out for a blast, and once again he found himself surrounded by the vortex of possible worlds that sucked avidly at his attention. Immediately he looked upward to avoid the distraction,

searching for a rope. But this time, the faceted panels formed a dome over his head which he couldn't see through. Oh, no! How was he supposed to locate a rope and climb out? The Minotaur had evidently adapted to the tactics that had been used against him last time. They hadn't counted on that.

"Trapped!" he howled at Torch through their communications link. Cries of despair and fear rang out all around him; his men must be discovering the same difficulty. There was no immediate response from Torch. Sarner resisted looking too closely at any of the virtuality portals beckoning around him, desperately trying to keep his eyes moving. But at length the sensory overload tricked his eyes into focusing on an image just for an instant. Abruptly he was gone, out of the Labyrinth of stone and into a much vaster labyrinth of myriad possible realities. He left behind him a banshee-like moan of despair, as his form faded away into elsewhere.

Torch found himself standing alone, unaffected, the sole person remaining on the floor of the great cavern. The others had all climbed up or been forcibly zoned out. He crouched, eying his enemy over the rim of his dented shield. He knew he had no chance of winning this fight solo.

The Minotaur appeared to be healing rapidly, regenerating all the hurts inflicted upon it by the Federation's dungeon commandos. It looked at Torch and held up one massive finger. Then it pointed at him, spoke a word or two, and flicked a glance upward. He understood. He was being let go. Though he could not say why.

Torch slung his shield on his back and hung his ax back on his belt. Then he sprinted to the nearest rope and leaped onto it, climbing swiftly, lest the implacable victorious guardian of the List should change his mind.

The two most common elements in the universe are hydrogen and stupidity.
-- [Harlan Ellison](#) (1934 -)

Chapter 47
Bad to the Last Drop

He zoned again, dammit, and just when he'd found something he could deal with, even enjoy. He'd been drinking in a bar with some guys who seemed friendly enough, swapping tales over brews. Given his colorful history as a law enforcement official, Roger Sarnar had plenty of anecdotes to contribute. He was just warming up to a recitation of the story of that Mall brain house that they'd busted in San Mateo last year – one of the last raids he'd been on where things had gone persistently right – when suddenly he felt the brief dizzy dislocation and his surroundings faded to grey blankness.

He came to lying on a bed. In some kind of flophouse? Didn't look like a very nice place, though it was clean enough. He needed a moment to recognize that it was his own quarters in the housing project they were using as a base for their ventures into the cyberverses. He sat up quickly. Somehow he must have gotten back. He was no longer trapped in the apparently endless regression of virtual experiences! Excellent.

Sarnar looked around. Everything looked just as he remembered it. How long had it been? And then the door to his room pushed open, and a man walked in. He gaped stupidly for a second, but then the man's identity clicked.

“Justin Turrell!” he blurted, astonished.

The man executed a slight bow that was somehow both sarcastic and effete. “And I of course know who you are,” he replied mildly. “Despite the fact that you did not deign to show yourself behind the mirror at our last meeting.”

Sarnar blinked. “I suppose your good buddy Robert Reynolds told you all about that.”

“Actually, no. Though I'm sure he would have, had I asked.”

Sarner sneered as he rose heavily to his feet. “No doubt.”

“Mr. Sarner, I've released you from the Minotaur's zone loop because I felt you and I needed to have a personal conversation.”

“Oh? What about?”

Justin smiled thinly. “About the failsafe abort codes you established with your nuclear weapons technicians.”

Sarner schooled his face into a blank look. “I don't know what you're referring to.”

“Of course you do. Four days ago, you left orders that tomorrow morning, June the 15th, the city of Columbus, Ohio was to be announced as a target for nuclear destruction. Twelve hours later, it is to be obliterated.”

“I seem to be more clever than I thought.”

“You're certainly not being clever at the moment. Remember Mr. Sarner, we have access to your past actions through the Cronus Scanner. You met with your military people and you gave them these desperation orders. You also told them verbally the names of the authorization code phrases, which evidently come out of a codebook, previously distributed some time ago, which we have not been able to find. I've come to obtain the abort codewords from you, which I expect are stored either in your head, or here in your quarters.”

“I don't know what you're talking about. But if you think I'd cooperate with you, you're not nearly as smart as your reputation suggests.”

“With so many lives at stake Mr. Sarner, I regret to say that I don't intend to give you a choice in the matter.”

“It's Secretary Sarner, to you.”

Justin shook his head. “Not anymore. Your own Federation Congress passed a resolution removing you, just last week.”

“Reynolds doesn't have the authority to pass bills!” he snapped irritably.

“True. So perhaps you are unaware that the Cyberantes, acting on information provided to them by the senator, have recently effected the

release of all of the other elected officials whom you were holding hostage?”

Sarner colored with anger, and looked past Justin down the hallway, seeking movement. Justin looked back over his shoulder for an instant, and gave a marginal head shake. “Your men all remain trapped in Palandria, Sarner. And I've made certain that our meeting won't be interrupted otherwise.”

“Will you let them out, as well?” he asked, to buy time while he considered. Was Justin armed? Did he have men surrounding the building?

“Of course. Your immersion units are rather basic, and I'm afraid the physical well being of your followers' bodies will begin to deteriorate if they're not released soon. To say nothing of possible dangers to their sanity.”

“Your trap hasn't affected me,” Sarner said with belligerence.

“Not a lot,” Justin admitted. “But then, you've arguably been insane for a long time.”

“You think it's insane to resist what you are, what the Singularity is doing to the human race?”

“Not necessarily. But it's certainly insane to impose the consequences of your views on other people, and to think that you possess some innate right to do so.”

Sarner drew himself up to his full height. “Anarchists like you have had the run of this planet long enough!” he began.

“Roger, you are being tedious,” Justin cut across him. “I did not come here to debate political philosophy with a truncheon-wielding thug. Let's discuss the abort codes.”

Sarner smiled grimly, as if he were certain that he had Justin trapped now. “No,” he said softly. “What are you going to do now that I've refused, beat it out of me?”

“Nothing so mundane.” Justin withdrew from his pants pocket a small device, about the size of an antique cell phone. “This is a quantum state

scanner. With it I can image every last molecule of your brain. Once instantiated in a computing substrate, obtaining the information I need from you becomes a matter of a simple database query. I did however wish to give you the opportunity for voluntary limited cooperation before resorting to copying your memory wholesale.”

Sarner backed up a pace, toward his jacket that lay flung over the top of a chair. He found himself disinclined to doubt the credibility of Justin's threat. “So how does stealing my memories equate to all your high-flown non-aggression principles?” he protested to gain time.

“It doesn't, I admit. But the threat which you have leveled against the lives of the many thousands who could never evacuate in time, in Columbus and elsewhere, compels me to choose between several evils. And since you have spent basically your whole life perpetrating aggression through your service in government, your being subjected to a taste of it yourself does seem to me to fall under the rubric of just desserts.”

With a lunge, Sarner completed his movement toward his jacket, and extracted his sidearm from its pocket. “I'll give you some just dessert, at 3000 feet per second,” he snarled, and snapped off two quick shots at Justin's chest.

And somehow missed, both times. As he stood shocked by his errant aim, Justin gestured sharply with his free hand. A misty grey tentacle lashed out like a whip from his fingers, curled painfully around Sarner's wrist, wrenched the gun out of his hand, and flung it across the room where it bounced off the wall and fell to the carpet.

“You're being tedious again, Roger,” Justin said warningly, and raised his scanning device.

As the whip-like tentacle faded back into incorporeality, Sarner reflexively massaged his own wrist, and like a stroke of lightning he suddenly understood. This wasn't real reality at all! They were still in one of Justin's damned simulations. All that talk about releasing him was just a trick.

Like a suddenly maddened bull, Sarner hurled himself roughly past Justin through the doorway and into the hallway outside. Then he turned agilely on his heel, almost pivoting, and sprinted down the passageway. He could hear Justin coming out into the hall to follow him. Good. He weaved some, trying to make it more difficult for Justin to aim the scanner at him. He wondered if he'd be able to sense it when it hit him, and how long the scan would take. Probably only a matter of seconds. As soon as he could, he turned off into an internal stairway.

He pounded up two flights, forming a plan in his head. He had little hope that he could do Justin any lasting harm in a virtual space. He'd certainly taken being shot at in stride. But Roger now knew that there were rules in all virtualities, and suspected that if he could force Justin's avatar to take enough damage, he might have to abandon it, giving himself time to escape by zoning somewhere else.

Sarner came out onto the apartment building's roof garden, which had a balcony railing offering a nice view of the street four stories below. It was late afternoon, the westering sun warmly lighting a virtually cloudless summer sky. Both the roof and the street were untenanted, unheard of at this hour. But then, why add needless clutter to a simulation? He took his position against the building, just behind the door, facing the railing. He struggled to silence his elevated breathing. These simulations were inconveniently good, sometimes.

Justin was only a few seconds behind him. He came out into the doorway, eyes flicking over the roof looking for Sarner. With a silent pounce, Sarner slapped the scanning device out of his hand, curled the other arm around Justin's shoulders and with an angry spasm of strength, knocked him tumbling over the balcony into space.

Hardly able to believe that he had done it so easily, Sarner ran to the railing and looked down. He was actually in time to see Justin landing, more or less on his feet. His lower legs seemed to blur slightly, as if becoming partially transparent. Somehow, that seemed to absorb the

energy of his fall, so that when his feet re-solidified Justin was standing calmly on the pavement. *Damn*, Sarner thought. He should have guessed he'd have some magical trick up his sleeve.

Roger Sarner's mind raced. What should he do now? Pick up the scanner and run? But Justin could follow, and if he could bend the rules of this simulation some more, he might even catch up. If he regained his device, it meant the end of what was probably their last remaining hope for victory. There wasn't time to figure out how to destroy or disassemble it. Imperative to keep him separated from it, then. But what was the best way to do that?

It suddenly struck him, almost as if the door to the roof had smacked into his forehead, that Justin hadn't bent the rules at all. Where had he said all his men were? *Still in Palandria*. Which meant that all these Minotaur-projected simulations, including this one, must be subsets of the overall Palandria virtuality. So Justin's miraculous safe landing was nothing more than a variation on his own safe-fall ability.

Which meant that he had another option. He could attack. He could go after Justin, try to beat the shit out of him, keep him too busy to go get his scanner. Justin might be some kind of wizard, but Sarner was willing to bet that he himself was a lot tougher hand-to-hand than a slight, effeminate intellectual loser like Justin could ever be. He'd learned long ago that in most situations, choosing whichever was the more radical and aggressive action usually got the best results. It kept the enemy off balance.

Roger bounced, catlike, up onto the balcony wall in a crouch. For the first time, Justin registered true surprise, followed immediately by concern.

"Roger, I really wouldn't do that. Don't be a fool," he called.

"I'll bet you wouldn't," he said contemptuously. Sarner's heart leaped, seeing his enemy's naked fear. And an instant later, so did he, and activated his safe-fall ability.

A sort of red and black explosion engulfed him. He felt a sharp, painful shock and heard an odd cracking thump. Everything seemed to spin around

him, leaving him completely disoriented. When his vision cleared, he realized he was lying on his side on the street, so out of breath that black spots swam before his eyes. An incongruous shaft of splintered, bloody white bone projected up more than a foot above his knee. He took a gasping breath, only to giggle it out again painfully as the attempt to work his lungs produced searing agony. The gasping/exhaling reflex went on convulsively, much like being zone-looped, only in his body with white hot pokers buried in his chest. His heart was pounding and he could not will his limbs to move.

Justin stepped into the narrowed range of his vision, knelt down beside him. "You utter goddamned fool," he said in a low voice. "This isn't a simulation, it's reality you stupid goof! I've sent for help. But they may not make it here in time." Justin rose to his feet again, and seemed to float upwards as though weightless, out of Sarner's vision.

This couldn't be real. It had to be a trick. But he'd never, ever felt pain like this. With a massive effort of will, Sarner forced his spastic breathing under control, made himself inhale shallowly, regularly, ignoring the sharp spears of pain in his diaphragm. Shattered ribs? Probably.

Shortly, Justin was standing next to him again, aiming the scanning device at him. Sarner glared up at him, doing his best to radiate rage. He felt nothing from the scanner. Justin checked the display, raised an eyebrow, shook his head, knelt down next to him again.

"This isn't a medical scanner, but it does give some indication," he explained. "You have three compound fractures of your right leg and one in your left. Your back is broken. Several of your ribs have separated from your spine. You're losing a lot of blood. All of that is fixable if you can be stabilized, but I'm afraid you don't have long. I don't have the necessary equipment to do anything for you. I'm sorry."

Sarner gritted his teeth, swallowed down a glob of coppery tasting bile that rose in his throat, and forced himself to gasp out words. "Did you... get--"

“What I came for? Yes. Your knowledge of how to save hundreds of thousands of lives will not die with you.”

To live like zombies, in simulated lives. How was that really better than being dead? But there was something that still didn't make sense. The pain and immobility was making his thoughts sluggish. Was that happening because he believed in this simulation? Was he dying for real because his mind thought he was? Oh yes, that was it. This couldn't be reality because Justin had done things here that were impossible.

“How did... you...” He could not complete the question.

But Justin understood it. “I thought that you might be inclined to knock me around a bit when you came out of it. So I took the precaution of arriving in a foglet body, instead of my usual cellular one. This form is made of a dense swarm of nanobots, packed tightly enough to give it definite form and weight, and make it able to manipulate objects, to generate speech sounds, and so forth. I control the foglet swarm via a wireless VPN. The same technique was used to simulate not myself, but Robert Reynolds and his two watchdogs, at our arranged conference. Actually, we'd already rescued Reynolds and stashed his guards in a hotel room.” He paused. “Incidentally, you're a pretty good shot at burglar range.”

If Sarnier could have thrashed and howled on the ground, he would have done. This plausible explanation raised the horrible, awful possibility that his current plight might just be real. As before, after the battle at Phoenix, he wanted a do-over with all his soul. Why hadn't he listened? Justin had even warned him! The ambulance simply *must* arrive in time.

“I don't-” he gasped out desperately, inarticulate with pain and fear and dimming vision.

But once again, Justin understood him. “Don't want to die? Most men don't want to die, Roger. If I had the power of saving you, I would. Not because you deserve it, but because withholding such aid would be tantamount to murder.”

Justin was silent for a minute, studied his scanner display again. Sarner listened in vain for sirens, or an approaching vehicle, or footsteps. After a while, Justin spoke again.

“I expect you will lose consciousness soon,” he stated baldly. “I suppose there is some chance that someone will put your name in, someday, for a TDR from Paradise Systems. In which case, we may meet again. I only know that I shan't be putting your name in. If you have any religious convictions, it might be wise to focus your remaining moments of awareness on such concerns.”

Justin rose, and Sarner found himself wishing he could restrain him. He didn't want to be left alone. He was beginning to shiver with cold, and it was getting harder and harder to breathe. He remembered the sniper who'd fallen to his death during their raid in L.A. It was strange to think that he was now sharing that poor bastard's fate. It sunk in, belatedly, what Justin was talking about: being resurrected by the Last Trumpet Project. Bitter laughter rang in his mind. That such should be his last hope. That was rich. What would his friend Maxwell Cleary say?

A rushing noise, like a high wind, sounded distantly in his ears. What was that? Death angels? Justin's foglet body launching itself into the heavens to bring on the Rapture like some ludicrous counterfeit Jesus?

Dimly, he heard his enemy say, cheerfully: “Then again, it could just be your lucky day.” He felt a flare of impotent anger. How could this be his lucky day? Then belatedly he put the statement together with the noise. *Aircar!* Dropping out of the sky. Help was arriving!

But the darkness was rising within him, as if the earth were swallowing him, or he was sinking into it. Pain, along with sight, was fading. His very surroundings seemed to pulse around him in time with his heartbeat. Like a blossom opening in his mind, Roger Sarner saw the face, not of Jesus, but of his late mother. Her severe mouth, perpetually compressed into a straight line of disapproval, and her accusing blue eyes, confronted him as sternly as if he were still a small boy caught sluffing off on his schoolwork. Abashed,

with nothing to say in defense, he hung his head as the blackness overwhelmed him.

He hung his head in shame because he was a failure.

God has placed no limits to the exercise of the intellect he has given us, on this side of the grave.
-- [Francis Bacon](#) (1561-1626)

Chapter 48
Riksana's Network

“So how many men would you say Cleary has left, that are still making a nuisance of themselves?” Stefan asked.

“Quite a few, actually,” Clay replied. “Several thousand. But not that many of them are still being a pain, these days.”

The Eutropian morning was well advanced, but the huge disk of its sister planet had not yet rolled behind the western horizon. The resulting effect was a peculiar, multi-hued lighting of objects, particularly on their western sides. They sat in the observation deck near the top of the very tower where Justin had met with Petrov to ask for his help with Project housing, late last year. The crystalline skyscrapers of the island city now found in the bay to the west reflected the light of both sun and sister planet like a distant, glittering pile of gems.

“The Federation's remaining men are scattered,” Clay went on. “Some of them have joined the KOJ, some have obeyed the cease fire proclaimed by acting-President Reynolds, and a lot have just quit – I expect being unpaid doesn't help. As you know, we helped Reynolds' people get the usable nukes all wrapped up, and that seems to have thrown them for a loop as well.”

“In the month since Secretary Sarnar's death, confusion has reigned among many Federation personnel,” Justin agreed.

“Did Roger Sarnar really jump off a building to his death?” Salma asked. She had rapidly lost all awe of Justin soon after Stefan had introduced them, and understood that he was an eyewitness.

“Indeed, he did,” Justin replied. “But I don't think he meant to commit suicide. He believed himself to be in a simulation. I summoned medical assistance, but he was pronounced DOA at the hospital facility.”

“Well I shan't shed any tears for him,” Clay said emphatically. “What he and Cleary started is still going on. We keep thinking that the IADC will be able to stand down any time now. But every day it seems we're responding to more alerts from subscribers. It isn't organized military or police squads anymore, as a rule. More like street gangs. Roving bands of Moshes are getting liquored up, or amped up on Luddite religious fervor, and going around beating and burning, razing buildings, and killing anyone who tries to stop them. As soon as our teams show up with overwhelming force, they scatter. The ones we catch we've been turning over to Reynolds' people for prosecution. But they almost never stand and fight. It's like a game of let's see how much we can destroy and who we can hurt before the law shows up. There's no longer any real point to it. It's just random violence.”

“There may be no central organization anymore, but the destructive conduct does still serve a purpose in the eyes of those who are engaging in it,” Justin commented.

“And what's that?” Stefan wondered aloud. “I confess it seems completely irrational to me.”

“Of course it's irrational. We've managed to thwart all of their organized plans for destroying the cyberverspace. Yet they still believe they're at war, and even that they're destined to win, some of them. This kind of petty terrorism is often seen from those who are predisposed to violent means, and yet at the same time feel almost completely powerless.”

“And I suppose we Cyberantes are making them feel even more powerless,” offered Clay.

“Very likely. Which is a leading reason why defensive force, no matter how overwhelming or efficiently applied, is unlikely to produce lasting peace. Petrov and I set in motion a plan to distract them from meatspace violence by giving them something, a goal, to chase in the cyberverspace. It bought us about two months' respite, during which a part of Sarner's forces spent much of their time jacked in, while the rest, and Cleary's KOJ people (who wouldn't countenance getting neural implants installed) basically

waited around for them to succeed.

“Most of the Federation people who were working that angle in the cyberverses were among the quitters that you mentioned. It seems quite a few of them decided that the cyberverses were actually pretty cool once you got to know it. We released all the ones who were trapped, naturally.”

“How did you manage to do that? Trap them, I mean?” Clay asked curiously.

“A tight feedback loop that kept their neocortexes in a constant state of incipient zoning. It works by exploiting the slow reaction and recycle time of their interfaced neurons.”

“Meaning it wouldn't work on a Full Sing,” Stefan said with a sly smile.

“Correct. In fact even Sarner's people could probably have broken out, if they'd just let themselves zone over and over again as fast as possible. The natural inclination, though, would be to do just the opposite.”

“But they were chasing a mirage in any case, weren't they?” Salma inquired. “I mean there is no Master Node List hidden in the cyberverses, is there?”

“Not in the sense that they imagined,” Justin allowed with an impish expression. “But there is a List, though.”

Stefan stared at Justin, and then guffawed. The others smiled, but didn't find anything hilarious.

“So what do you think we should do next, Justin?” Clay asked. “This random gang violence, anti-computer terrorism, whatever you want to call it, isn't going away, and from what I've seen in the news it's spreading widely around the world. Particularly in cultures that were never terribly enamored of high-tech to begin with.”

“I expect,” replied Justin cryptically, “that an answer to that question will be forthcoming soon.”

This was not the hoped-for response, and a lengthy silence ensued in which they all merely enjoyed the burgeoning Eutropean morning.

A woman suddenly appeared, climbing up the embedded spiral stairs

onto the deck. She was petite, Asian, her face beautiful but somehow incredibly formidable at the same time. She was clad in a floor-length form-fitting dress made of brilliant crimson silk. Justin rose to greet Riksana with a welcoming smile, and she crossed to him to share a brief kiss.

"I presume that was good timing," Stefan said in his deep voice, offering her his hand, which she took.

"Oh? I'm not late, I trust," she said casually.

"Not at all," Justin assured her. "Are you where I think you are?"

Riksana nodded, smiling. "Indeed."

"Then may I introduce Clay Thorsten and Salma Rivera, both principals in the Cyberantes organization."

"Riksana Namoto," she said, shaking each of their hands briskly. They all took seats around one of the large tables, Clay deploying its umbrella.

"That is a lovely dress, Ms. Namoto," Salma complimented.

"Oh, please call me Riksana. Thank you. Our mutual friend Cylara designed it for me. She speaks fondly of you – both of you," she amended, gesturing across the table to include Clay.

"And where exactly is it that you are, apart from here in Eutropia?" Stefan asked, raising an eyebrow.

"Right now, I'm living on Alpha Centauri II."

The two biological Sings were completely stunned by this. Stefan grinned and exchanged a look with Justin.

"Two weeks ago," Riksana went on, "the spaceship *Thorne* made landfall on the second planetoid in the Centauri system. It's your basic barren rock in space: plenty of minerals and a whisper thin atmosphere but no indigenous life. The ship's complement of manufacturing nanobots were able to construct diamondoid molecular circuitry out of local materials, along with nanosolar cells for power. We now have a high-capacity brain house built on that planet, and the settlement is expanding rapidly."

"That's fantastic," Clay opined. "But how are you speaking to us live, in real time? Even the telecom link through the wormhole would be lagged by

a few seconds I would think.”

Riksana beamed appreciatively. “Very astute, Clay. In truth I have almost no transmission lag at all. The host for this instance of the lovely Eutropia simulation is located in high Earth orbit. And so is my quantum networking terminal.”

“Entangled particles,” Salma said, marveling.

“Yes. Which allow transmission of binary data instantaneously across any arbitrary distance by manipulating the states of the entangled particles at both ends. I uploaded the program to Kip, the AI on the *Thorne*, via the wormhole connection. One end of the quantum terminal is now running on the hardware in the Centauri brain house, the other in Earth orbit. We can now stripe data, or multi-thread any software, across hosts in different star systems any distance apart, without even needing to use a wormhole communications pipe.”

“Wow,” Clay said, digesting the implications. “But don't you have to send the entangled matter through the wormhole?”

Riksana shook her head. “No. All you have to do is transmit the quantum state details of the subject matter at one end. You then find suitably identical particles at the other end. In the lab we used free hydrogen atoms, for simplicity. The entanglement is then applied energetically. You only need the wormhole to bootstrap the process.”

Stefan looked like a child buried in Christmas presents, as he savored every word of Riksana's explanations, though he'd obviously heard it all before.

“But if you can pattern quantum entanglements by the application of energy...” Clay trailed off, not sure where this would lead. Physics was never his strongest subject.

“Exactly!” Stefan agreed exultantly.

“Exactly what?” Salma asked, openly puzzled. “You physicists need to explain to us lay people.”

Riksana looked genuinely apologetic. “Do forgive me. To conclude

succinctly, the quantum networking technology was needed in order to utilize effectively another invention: the energetic patterning of matter for cold computing.”

Clay laughed. “I'm afraid that was a bit too succinct.”

Justin broke in. “You know that for years now, we've been doing computing and data storage with molecules, and in three dimensions. In cases where the energy required to effect binary state changes in the molecules can be recovered and reused, instead of being dissipated as waste heat, this is known as reversible computing, or cold computing. It's never completely cold of course, because the nature of any useful program is that inputs and outputs will not be conserved, and hence those can never be recycled or reversed.

“So with current technology we are still faced with two problems, two limitations if you will: the need to construct the molecular structures used for computing (usually by means of nano-scale molecular manufacturing robots), and the need to supply operating power to the computers once built.

“It was seriously suggested more than forty years ago that computing could also be done using any arbitrary matter. A lump of rock, for example. A given weight of solid material contains an astronomical number of atoms, each of which possesses a number of intrinsic characteristics that could potentially be used to represent 0 and 1: vibration rates, electron shell states, spin, charge, etc. The trouble is, the atoms in a lump of rock exhibit these characteristics at random. That is, the naturally occurring values represent no meaningful data and perform no useful work.

“The research done by Riksana, and others, demonstrated that matter could be patterned – aligned, if you will – so that a requisite percentage of its constituent atoms adopted consistent desired values for one or more of their intrinsic characteristics which could then be utilized as qubits. And that this patterning could be achieved by means of the targeted projection of a type of quantum energy, sometimes known as transverse energy, which

permeates the unified field. Liken it if you will to a process of applying energy through ordinary heating, but with the important difference that while heating increases ambient energy, it does not simultaneously decrease the degree of randomness.”

“Basically, we no longer need to build computers,” Riksana stated bluntly. “We can just pattern matter, in almost any form, to *act* as a computer when we want it to. Or to store information.”

“And once you've done that,” Clay said slowly, “you don't have to apply any more energy to it?”

“No. Not unless it runs down by dint of expending energy transmitting results outside the sample of patterned matter.”

“But if some of the atoms in the sample were quantum entangled with other atoms at the location where you wanted the results sent, and those atoms were part of the logic gate...” Salma breathed.

Riksana nodded. “Very good. Which did create a problem of reverse feedback for us. We don't want something at the destination to tweak the particles at the end of the logic gates in reverse, and thus mess up the computation results in the constituent matter.”

“And how on earth did you solve that, by the way?” Stefan wanted to know, suddenly serious.

“Energy state barriers, proactively insulating the receptor particles without altering their qubit values.”

Stefan whistled. “I'd like to see the equations governing that.”

“I'll see that you get them,” Riksana promised.

“So now that you can sort of point at a rock and go, “Thou art a computer!” and then network all the rocks together in real time, you can literally build a server that has components all across the universe,” Clay summed up. He looked up speculatively at the sky. “You know, as a marketing guy, I think I could sell that.” Everyone laughed.

“Well that will certainly put civilization beyond the reach of any future Operation Skull Fractures,” Salma said. “But I don't see how it will help us

with our Mosh terrorist problem. Not unless you can re-pattern the brain cells of the Reverend Clearys and Roger Sarners of the world so that they suddenly see reason.”

“No, that wouldn't work,” Justin agreed. “We could pattern some of the atoms in their brains, I suppose – though as a rule it would be better to choose a more durable arrangement of matter, such as a rock, rather than something subject to biological processes, because those tend to swap around a lot of atoms fairly rapidly. But in any case, computing with the atoms in a brain wouldn't change the function of the brain at the cellular level. And even supposing that it did, and in a controllable way, it would be most unethical.”

“Nevertheless you hinted you *do* have a solution,” Stefan reminded him.

Justin grinned enigmatically. “Oh yes. But not immediately. We still have a lot more work to do.”

“Who is this 'we' of whom you speak, white man?” Riksana asked with feigned indignation. “I'll have you know, as of now I'm officially on sabbatical. Or vacation even, in the great new tourist trap destination, with tin man Kip and his merry crew of nanobot castaways, guarding the golden fleece from the centaurs at the end of the wormhole rainbow. And I *do* expect some companionship in my travels.”

Justin stared at her, apparently dumbfounded. “It might be wise, if you didn't try to network so many *metaphors*,” he cautioned solemnly. Then he brightened. “But of course, I'll come with you. I've been looking forward to Alpha-C.”

“But what's *there*?” Salma said.

Riksana shrugged. “Whatever we want to put there. Same as here.”

“You should kidnap Petrov and get him to build the Alpha-C II that everybody imagined they'd find when squishy humans finally reached the place,” Stefan suggested.

“We won't need to kidnap him,” Justin predicted. “I'm sure he'll be there faster than you can charm a quark.” He furrowed his brow slightly as if

something had just occurred to him. “You know, Stefan,” he continued, “we’ll be able to pattern quite a lot of matter in the Centauri system. Very stable matter. Lifeless, climate-less, tectonically inactive. How many souls are you planning to send us in, say, the next year?”

Stefan rolled his eyes. “So what am I now, Hades? Whereas you're Hermes, she's Athena, Petrov is presumably Hephaestus, though at least we haven't got a Zeus yet – thank God! If you please, Justin, *we are now doing TDRs* at the rate of about two hundred thousand per day and building. Your consortium is going to open-source the technology for the matter patterning, I presume?”

Justin and Riksana nodded. “We’ll publish the scientific white papers and the algorithms,” Riksana confirmed. “I expect computer hardware providers will all write their own control firmware. Or ours will be available to license, if they prefer.”

“Then I might get the rest of my two billion yottacalcs a lot faster,” Stefan said with satisfaction.

“Yeah,” Justin said. “Not exactly a shortage of non-living, low-energy dense matter in two solar systems.”

“You people really are a bit like gods,” Salma remarked, awed.

“Humans aren't godlike yet,” Riksana disagreed modestly. “But, we're coming along.” And she smiled.

One of the main causes of trouble in the world is dogmatic and fanatical belief in some doctrine for which there is no adequate evidence.
-- [Bertrand Russell](#) (1872 - 1970)

Chapter 49
Justin on the List

“Sailboat races, eh?” An unfamiliar voice penetrated Torch's reverie as he gazed out at the regatta forming up in the harbor below, sleek sailboats of all descriptions and designs flashing in the brilliant morning sunshine. He nodded minimally, keeping his attention focused on the yachts being prepared, hoping that his lack of any further response would motivate the speaker to do the polite thing and simply move away.

“A new passion of yours, or are you just punishing yourself for having alienated your girlfriend?” the speaker continued in an amused tone. Irked, and disturbed by the obvious implication that this person must know him, Torch turned his head and glared at the source of the voice. He was astonished to recognize Justin Turrell standing there, dressed in casual clothes topped by a windbreaker. The lively breeze twitched his short, sandy hair; a friendly smile suffused his face.

“May I?” Justin continued, gesturing at the empty bench spot next to Torch. Still stunned, Torch acquiesced. What could Justin possibly want with him, now? He'd given up on the quest for the Master Node List after Roger Sarnier died. Though he hadn't yet dared to level with his father about what he was really doing in the cyberspace these days. It was odd that his psycho-pattern detector, which he still carried with him, hadn't even alerted him that Justin was in the vicinity.

Justin discerned the ticket stubs protruding from the top of Torch's breast pocket. “Ah, I see. You are wagering on the race results.”

Torch shrugged. “So? Man has a right to spend his paycheck how he likes.”

“Indubitably. But you earn your pay mainly by working in meatspace, yes?”

Torch flicked him an indifferent glance. "Not that it's your business, but yes, I've found that I can earn more money quickly by taking contract jobs from here, to be performed there."

Justin nodded pleasantly. "A wage price differential which naturally results from the fact that most people would rather spend their time here, than there. A pity that endemic scarcity and government interference prevent meatspace from having the same standard of living as the cyberverses."

"So what's your point, that the cyberverses is more popular than real life? Have you come here to gloat, is that it?"

"Not at all. The mere recognition of facts which are determined by the sum of billions of individual choices seems to me like a poor excuse for gloating. Though I would observe that your own choice of leisure activities hardly seems to separate you from the silent majority."

Torch shrugged again. "I've always recognized that the cyberverses offered enormous possibilities for enjoyment."

Justin was silent for a moment, scanning the assembling racing craft being chivvied into starting formation by their crews. "And yet, you insisted to yourself that you only wanted Cylara on your terms, in real reality. Why were those terms so imperative to you?"

Torch had wondered that himself. But he wasn't about to give Justin the satisfaction of knowing this. "If I wanted a relationship counselor, I'd go see one," he said irritably.

Justin chuckled quietly, but in a kindly way rather than a derisive one. "I'm not here to counsel you, either. You already know all the answers to your difficulties, I'm sure."

"Then why are you here, Justin?" Torch asked, turning to look him full in the face for the first time.

"To give you some information, of course. And to offer some explanations on points you may have wondered about."

"What sort of information? I should warn you, I'm through being

manipulated by other people.”

“Very wise. The information is simply this: a short time ago, a team of Full Sing researchers perfected a means of patterning matter to perform computation, and to network that matter together at the quantum level. As a consequence, non-biological consciousness can now reside in any matter whatsoever, without the need to change its outward form. In a relatively short span of time, we'll be able to pattern enough matter to host the collective consciousness of all Sings, including millions of TDR clients, along with the entirety of the cyberspace as it exists today.”

Torch digested this for a while, wondering whether Justin was bluffing. “Which means,” he concluded slowly, “that any efforts to destroy the world's computing equipment will become moot.”

“Exactly. Which in turn implies that your KOJ's quixotic quest to destroy certain computer hardware, or all hardware everywhere, becomes pointless, even were it an achievable goal – which it is not. Instead, they would need to destroy all solid matter. And not just here on Earth, but throughout the solar system. Indeed, throughout *two* solar systems – so far – because we're now patterning matter in the Alpha Centauri system as well, in the wake of a successful colonization mission. Which means, Torch, that only God could destroy the cyberspace, now.”

“Well perhaps He will, then. My father believes–”

“Your father believes that the righteous must triumph, because he has a jaundiced view of who the righteous are, and above all because he *needs* to believe it. The set of values and cosmological truths to which he subscribes leaves him no other choice, regardless of the realities of the situation.”

“People like my father have the right to defend their way of life,” Torch argued.

“They do. But their right ends where they attempt to impose their way of life on others.”

“But how can these different views on the very nature of living possibly coexist?”

Justin gave him a sympathetic look. "You've encountered enough trouble trying to harmonize them within yourself, haven't you? However, you beg the question. Coexistence is what's required."

"But if one viewpoint requires the extinction of the other..." Torch trailed off.

"Then that is the classic pattern for war, and so each must be prevented from wreaking destruction upon the other. That is exactly what I have attempted to do. And I want to thank you for the part you've played toward achieving that end."

This sounded to Torch like Justin was saying he'd been manipulated even more than he knew, which only made him angrier. "I haven't been working for you. In trying to find your List, we acted on a tip given us by members *of your own community* who are working at cross-purposes with you. I wonder what *they* think of your matter patterning plan."

"Actually, they're ecstatic about it." Justin sighed. "We told you that that was the case, because *that is how Moshes might behave*. Thus, you would be inclined to believe it. Humanity grew up in a world of scarce resources, one group forced to compete against another. As a result, many people have always imagined that life is a zero-sum game. In order for you to win, someone else has to lose.

"Fortunately that has never been strictly true, and humanity's progress over time is proof of this. But it is certainly no longer the case in our post-Singularity universe. Thanks to human creativity, a paradigm of abundance has replaced that of scarcity. If anyone in *our* community truly wanted to create their own network, or make a brand new cyberverses, there is absolutely no reason why they couldn't just go do it. Nor would they have to destroy anything that already existed, or take anything away from anyone else, in order to do so."

Torch mulled this over. It certainly had the ring of truth, especially given this latest advancement about matter patterning. "So what you're telling me is that the whole business with the Master Node List was a hoax."

Justin agreed pleasantly: "Of course it was. I wasn't sure you'd all believe it, given that the whole concept flies in the face of everything that's ever been published about DR.OS – including the source code! But Petrov was convinced you would, because the existence of a secret central control mechanism chimed with everything in Mosh history, which after all has been replete with cabals and cartels and shadow governments and secret societies and inner sanctums for millennia. And he was right. My friend Petrov is a truly wise being."

"Only Sarner suspected it might be a trick," Torch recalled.

"Because he possessed a serpentine kind of mind, and such thinking came naturally to him. In the end of course, he thought I was tricking him when I wasn't, and died for his mistake."

"So why the hoax, then?"

"To forestall further violence in meatspace. We were never truly worried about ourselves, you understand. But we felt an obligation to keep the Moshes and the bio-Sings from killing one another. And, for nearly two months following Phoenix, it worked reasonably well."

"I expect it also bought you time to make your matter breakthrough."

"Quite true. But that would have happened anyway. However, now that we've got it, I believe we can do something about that coexistence problem we discussed earlier."

That sounded interesting, but Torch sensed Justin wasn't likely to give him any previews of their plans. "So why are we having this conversation, exactly?"

"As I said, I wanted to thank you for playing your part. Of course you weren't working for me, and had you been, you could never have done the job we needed you to do nearly as well as you did it. But I do recognize that you have taken harm from playing this role, and I hoped I might be able to help you recover from some of its consequences."

Torch sighed wearily. "I betrayed my friends. I lost the woman I love. I've come to question everything I ever believed. And on top of that I failed,

and from what you're saying I could never have succeeded. So it was all for nothing. Yeah, I guess you could say I've paid a price for my role, as you call it."

"Quite so. Yet the beginning of your recovery lies in your questioning. You have lost much but you have also gained. You have gained knowledge of the truth."

"What truth?" Torch asked warily, watching his face carefully.

"You've learned the truth that many of the things which you deemed were good and right, have no particular virtue in them. You've learned that many things which you thought were evil, are not so. Before, you chose from prejudice. Now, you can choose from knowledge. That's a very large difference."

"But what choices have I got left? It seems to me that I already made a bunch of choices, with unhappy consequences."

"And it seems to me that the most important choice you have yet to make is to choose to forgive yourself for making them. Your friends, your girlfriend, everyone you know in the cyberverses, will readily forgive you and accept you. But that will all be meaningless if you cannot make peace with yourself. You must choose the path that *you* wish to walk, not continue to walk down someone else's."

"Maybe. I'm not sure about Cylara ever accepting me again. And I notice you don't include my father on your list."

"As for your father, you have yet to make any choices which would truly disappoint him. That's yet to come. And you're right, you do face the danger of conflict there. But as for Cylara, did she not tell you exactly what you needed to do to win your way back into her heart? In my experience, women can hardly resist doing that." And he grinned at Torch, who couldn't help but smile back, because Cy most certainly *had* told him.

"I know enough about women to know that my real crime in her eyes was having a separate agenda, that didn't involve loving her."

"Indeed. When a woman finds out that a man she cares about isn't with

her because of love, the ground tilts under her. It's a deeply instinctual thing, and also quite a logical reaction if you think about it from the standpoint of maximizing her chances for successful reproduction."

"So she wants me to prove to her that I really do love her, that it wasn't just mixing business with pleasure while I did my job."

"And also, presumably, that you understand that love is a matter not of possession, but of acceptance."

"That too. Yeah, she essentially told me that."

"As did I."

Torch thought back. "You mean the message of the old witch at the Courts of Minos about possessing only what is truly yours. When Sarner and I were following you."

"Yes, that. Technically, you were not following me, you were following my Paia, but she was using my avatar and acting on my instructions. She crafted a number of implicit messages for you, which only you would be likely to interpret correctly."

Now that he had the opportunity to ask, Torch had to admit that he was curious. "That last part was pretty obvious, but I confess I remain puzzled about the bit with the gold bars."

Justin smiled. "It indicated that the wealth you sought was not what it appeared to be. The gold appeared to be desirable wealth, but you could not take it with you. The obvious analogy is that you sought a life in meatspace with Cylara as your wife, yet could not take her with you out of the cyberverses. But what's really valuable to you is having her in your life, period. The place is unimportant."

"The coronation of Henry IV, the Huguenot king who converted to Catholicism, was intended as a reminder of the problems stemming from religious intolerance. And that a man who wisely chooses peace and tolerance over obstinate doctrinal purity can do much good in the world, as Henry did with his Edict of Nantes, which ended a bloody civil war, for a time. Your father is the obvious contemporary exemplar of religious

rigidity, a hideous thing which can lead even to murder.

“The episode with the ladies on the Spanish beach was meant to suggest several things. One, that so-called artificial intelligence is no less human, or vulnerable, or capable of feeling, than biological intelligence. Second, that Cylara was unquestionably first in your heart. And finally, that you were in a very real sense following in my footsteps, not only literally but figuratively.”

Torch raised an eyebrow at Justin. “I got most of that. Later on, if not at the time.”

“I thought you would. But what are you going to do now? The Minotaur let you go so that you would be free to ponder that question. I cannot choose for you, but it does seem to me that hanging out in the cyberspace without your lover makes little sense, when you could be hanging out in any number of virtualities with her.”

“Well maybe I need to forgive myself first, like you said.”

Justin laughed, not at all mockingly. “Perhaps. Well, maybe this will make doing that a little easier.” He handed Torch a small coin-like disc, embossed with the Singularity crest, much like the one McGivens had given him last year.

“And what's this?”

“Why, the List that you were seeking.”

Torch frowned. “I thought you said there wasn't one.”

“The one you were looking for didn't exist. But I had to give the Minotaur something to protect, didn't I?”

Torch found himself returning the laugh. “In case we actually bagged him, you mean. So what's on it?”

“Have a look.”

Torch pulled a palmtop reader out of his jacket pocket and inserted the disc. In the display he saw nothing but an immense list of names, given in pairs. Not names of servers or virtualities or their coordinates, but of people. Why, there was Justin's name, next to that of someone named

Riksana. And further down, his own name, Daniel Cleary, next to Cylara's. His mother and father's names were here. Salma and Clay. Even those of people who never existed, but were legendary couples nonetheless: Romeo and Juliet, Tristan and Isolde, Aragorn and Arwen, Paris and Helen of Troy.

"It's all couples," Torch observed, certain there was another message here.

"Names of people throughout time, real or imagined, who have loved one another," Justin clarified. "In a very real sense, what holds the cyberverses together – verily what holds human civilization together – is not some distant authority, but our ability to love. Authority is in many ways the antithesis of love, because the essence of mutual love is choice. Everyone chooses who and what to love; such choices cannot be decreed. And so if you'd succeeded, this is what I wanted you to find."

Torch shook his head, marveling at the irony. "I'm not sure my father would get the point. And I'm pretty sure Roger Sarnier wouldn't have."

"Yet you're going to have to tell your father something. You can't change him, Torch. But you can offer him love, and forgiveness, just as I'm sure others will offer those things to you."

Torch could but nod. He suddenly understood, with a self-evidence that made it almost embarrassing, that this man sitting next to him was not evil. "Thanks, Justin," he said sincerely. And he offered his hand, which Justin shook warmly, like a friend. Then Justin rose to go. "About Cylara..." Torch began, forestalling him.

"You're thinking you could use some analog of a big bouquet of flowers, to make a good impression?"

Torch smiled. "Something like that. Any suggestions?"

"I've just given you some news that's not even a week old, and far from common knowledge. See what you can make of that." And with a final wave, Justin turned away, walking back up to the top of the grandstands.

Torch turned his attention back to the regatta, which was now getting ready to start. It no longer seemed to matter to him how his bet turned out.

Any given race like this one might be a zero-sum game, but his future didn't have to be.

[None of us really changes over time; we only become more fully what we are.
-- [Anne Rice](#), *The Queen of the Damned* (1988)

Chapter 50
Love Reloaded

They raced their horses across the wide valley, galloping side by side along the course of a small creek that ran down from the surrounding hills. Sagebrush and dry grasses flew past beneath churning hooves. As their course began to tilt upward, ascending the hillside, Cylara slowed her mount to a canter, then to a walk. The horse blew out a loud neigh. Beside her, Torch turned around to look back the way they had come and whooped.

A long upland valley lay before them, more than a mile wide, snaking up into a great bay between the mountains. In the middle, the little creek joined a larger river which flowed down the length of the valley from the heights, glittering in the blazing afternoon sun. Lingered winter snow pack glistened in the top crevices among the purple mountain pinnacles. A large ranch house with attached stables stood far down the valley, awaiting their return.

Cylara thought this place looked like somewhere in Montana, but she knew it wasn't, merely a virtual artist's conception of a western mountain ranch. She'd suggested it because she thought it was important to find common ground with Torch, places where they could both live happily. Fortunately, simulations that were based on, or at least inspired by, meatspace locations were quite common. This was a good one, although she knew it supported a mere ten miles or so of explorable territory centered on the dwelling. At the moment, it was a private instance.

But in a few hours, Salma and Clay would be dropping by for dinner. It would be the first time they'd all been together since she and Torch had made up. Cylara had pulled quite a lot of TRT duty shifts with the Cyberantes in the two months they'd been apart. With those and work she had filled most of her time. But these past few days, with her guy in her life

again, she'd taken some time off. Pondering her own motivations, she realized that she'd spent so much effort helping the Cyberantes because she'd felt a certain need to pay something back, to atone because of Torch. His own membership in the IADC was still under suspension, and she wondered idly whether Clay would bring that up over dinner tonight.

Torch beamed at her as they let their horses stand blowing. His flaming hair was mussed where it wasn't hidden under his wide-brimmed western hat, and his sparkling green eyes twinkled with enjoyment as they looked into her hazel ones. He seemed much more willing to let go and truly appreciate each situation and experience they shared. She guessed this was because he'd finally let go of his prejudice that virtual experiences were somehow "less" than 3D ones.

She'd quizzed him about the reasons for his sudden change of attitude, and he explained that he'd had a conversation with Justin which had done a lot to change his mind. She'd never met Justin, but knew from her contacts with Riksana that dealing with the High Sings could be a profound experience. It was Riksana who had helped her to see what she'd needed to do to motivate Torch to decide to come back to her. And now it seemed that this relationship was going to recover, instead of fading away like her previous ones. Though there had been times when she had despaired of ever hearing from him again.

One fly in the ointment remained, however. She nudged her horse forward toward a pool in the little creek nearby, which still held some clear water. The horse went quite willingly, sniffing eagerly at the water and putting its head down to drink as soon as she relaxed the reins. Torch maneuvered his horse to a corresponding position on the opposite bank.

"Torch, I don't mean to spoil the moment with an uncomfortable subject, but we've got company coming soon, and I think we need to discuss your dad. What do you plan to do about him?"

To her relief, Torch didn't seem put out that she had brought up the topic. He looked at her calmly and spoke steadily. "Well, I'm going to go

see him, and mum. And I'm going to explain to them that I've rethought my beliefs and I can no longer support what they're doing. I'll tell them you mean more to me than their religious beliefs. I'm going to resign formally from the Order. And once I've done that, I'll apply to the IADC for reinstatement."

"Yeah, I wouldn't blame Clay if he insisted on you resigning from the KOJ first. But how do you think your parents will react?"

Torch shrugged, as if unconcerned. "Well, mum will probably go to pieces and act like she'd just been told I was dead. Dad will get mad, and probably yell at me like I was eight years old. He'll accuse me of being stupid, and traitorous, and maybe a pussy-whipped fool into the bargain. But once he realizes I'm serious and won't back down, he'll probably disown me and never speak to me again. I'm sad about that. But I just can't let the man and his beliefs run my life anymore, Cy."

She agreed silently, but felt a twinge of guilt that he would have to endure permanent separation from his family for her sake. "Do you think it would help if I went with you?" she offered.

He laughed heartily. "Once they see how drop-dead gorgeous you are, I'll get the sex-brained boy routine for sure, big time."

She smiled back. "But would it make it any easier for you?"

Torch became more serious. "Of course it would. You're the one that made me see how I wasn't being true to myself, and that until I did I couldn't be worthy of the love of someone like you. You can't really love someone properly unless you love yourself first. And all the while I was doing those things, spying for the KOJ and all, I despised myself for it. I hated lying to you Cy, and it was sure a poor way to repay you for what you offered me. So now I have to tell the truth to my old man, no matter how much it hurts. But sure, you can come if you want."

She nodded. "That's settled then. When do you want to do it?"

"Soon," he said noncommittally.

"It's the first of August tomorrow," she supplied unnecessarily.

He shrugged. "Maybe in a week or so. I've got quite a bit of work lined up."

She wasn't about to interfere with paying work. While she had plenty of resources of her own, a boyfriend who could pay his own way was infinitely preferable to one who might become dependent on her. Though in fact he'd already made her quite a lot of money, or more accurately saved her a lot of money. Because of the news he'd shared with her about the matter patterning breakthrough, she'd been able to have Paia exit her long positions in those two computing cycle futures contracts at a nice profit. The day before yesterday the news had finally been publicly announced at a press conference, and the value of those contracts had plummeted, along with the stock prices of a number of companies which were dependent on marketing previous technologies. It would likely be a long time before the markets adjusted to all the staggering implications of this latest development, so for now she was holding onto her gold until the wild swings subsided.

"The cyberverses will be expanding geometrically now, and it'll cost almost nothing," she mused. "I wonder how much we'll even need to work in the future."

"We'll all be renting out whole worlds for a song, not just seventy-eight square miles of nature and a house," he said, referencing the dimensions of this simulation. "We'll be rich, baby!"

She smiled. It was true that progress made everyone comparatively richer, and quantum leaps like this were bound to pound down the price of almost everything in existence. But regardless of how abundant computing or other resources became, the pricing mechanism of the market would always remain as an essential guide, to channel demand and tell producers and providers exactly how much of everything was needed. Her biggest financial burden that still loomed was maintaining her house in meatspace, where everything cost more and real estate prices tended to remain stagnant, due to low demand.

"I'd say race you back to the house, but I don't think the horses would appreciate it," she joked.

"Oh come on, they're just simulations," he said, daring her.

"Realistic ones, that even get thirsty. I just can't bring myself to wear out a poor horse. Not in this heat."

Torch laughed. "Okay, maybe you're right. Let's canter then." Clucking to his mount, he turned it around and started it trotting forward, down the opposite bank of the creek. She crossed over and gently kicked her mare into step alongside. They picked up speed, the horses shifting gait and whinnying as they perceived that they were headed back toward the stables.

Despite her words, Cylara had to resist the urge to kick her horse back into a gallop. They reached the larger river and turned to follow it downstream. Her blond hair streamed out behind her, floating under her hat with her speed. It was going to be a mess. After they rubbed down the horses, she'd have just enough time to get cleaned up and changed. The cooking, of course, was automated.

These earthy, visceral real life simulations Torch seemed to favor did have a nice feel to them, she had to admit. Despite the fact that you actually had to worry about dirt and brushing your hair. She felt more intensely alive in a physical way, more attuned to her senses. And strenuous riding always made her horny as hell, something Torch would discover soon after their guests departed.

Cylara was intrigued by the hints which had been dropped by some of the Full Sings to the effect that the war would soon be over. She hoped it was true. The future whispered of peace, prosperity and happiness. The bright sun of this virtuality seemed to shine on her whole life at this moment. Content to enjoy the ride without hurrying, she maintained a smooth, easy canter. Torch kept pace beside her, as if he couldn't imagine being anywhere else.

Everywhere you prod it, even with the shortest stick, the established system isn't simply corrupt, it's unequivocally putrescent. The law is created by demonstrable criminals, enforced by demonstrable criminals, interpreted by demonstrable criminals, all for demonstrably criminal purposes. Of course I'm above the law. And so are you.
-- [L. Neil Smith](#), *Pallas* (1993)

Chapter 51
State of the State

The signing ceremony was only a few minutes away. For those few remaining minutes, Senator Robert Reynolds would continue to be acting-President of the North American Federation. After the ceremony was concluded, he would no longer be the chief executive, or even a senator, because the North American Federation would no longer exist.

The Articles of Dissolution which he was about to sign were not his idea of a good piece of legislation. But the simple fact was that it didn't really dissolve the Federation so much as give mere formal recognition to a state of affairs which already existed. In legal parlance it rendered *de jure* what was *de facto* reality already.

Reynolds found himself thinking, as he usually did at such times, about historical events which paralleled the present. In this case, he pictured himself standing approximately where the last Premier of the Soviet Union, Mikhail Gorbachev, had stood in late December of 1991. Gorbachev had wanted openness and reforms, but had finally been forced reluctantly to recognize that the Soviet Union was done, particularly in economic terms.

The Federation was likewise finished, there was no doubt of that. Its monetary functions were inoperative due to the total worthlessness of its currency. Its regulatory functions were impaired in the cyberspace by a complete lack of enforceability, and in meatspace by a complete lack of enforcers, due to its inability to pay them. The Federation's responsibilities for the provision of infrastructure were long ago usurped or made irrelevant by technological change. Its border enforcement functions had been a joke without a punchline for years. Its record-keeping functions were

performed more accurately and efficiently by private AIs. Even its charitable safety net functions had been assumed without difficulty by private parties in the wake of its currency collapse. And with the new cornucopia of benefits now in the pipeline from the matter patterning breakthrough, there would be even less reason to worry about unmet basic needs in the future.

Worst of all, the government's law enforcement functions were not only impaired, they had actually begotten and helped perpetrate the worst wave of crime and violence ever to ravage contemporary society. More murders, thefts, beatings, rapes, destruction of property, and acts of vandalism had been committed under color of law by the late Roger Sarnier's Homeland Security cohorts – abetted by the KOJ radicals – in a span of a mere three months, than had been committed by all the world's private criminals taken together over the past ten years.

Lastly, the Federation's military arm had not only been pressed into service on behalf of Homeland Security's sociopathic objectives, but had very nearly been utilized to commit indiscriminate mass democide. But for the timely intervention of Justin and the IADC, the Federation would have been devastated by its own aged nuclear arsenal.

This final circumstance had virtually dictated the date of today's bill signing: August 6th, 2045. Today was the one hundredth anniversary of the bombing of Hiroshima. The citizens of the Federation had decided, in no uncertain terms, that a government which could plot to do such a thing, especially to its own people, was simply too dangerous to go on existing. That Cyberantes woman he'd met, Salma Rivera, had been right. Reynolds had found little enough support for rebuilding the Federation among his own fellow officials, and virtually none amongst the people.

So, like Gorbachev before him, he bowed to the inevitable. What was still unclear was what, if anything, would eventually replace the Federation. Some pundits predicted the development of a patchwork of local governing bodies to enforce property rights and certain basic legal prohibitions in

meatspace, something like glorified homeowners associations. Others anticipated that the Cyberantes model would remain in vogue, where competing private security services would provide protection, investigate crimes involving aggression against persons or property, and administer a system of punishments and restitution. Still others openly predicted total meatspace anarchy – and frequently asserted that that was okay with them. But one thing was certain: there was simply no support at present for the creation of a substitute overarching government with plenary powers.

Oddly, he could detect no inclination on the part of those who had effectively been left in power as the Federation disintegrated to exploit their position. Thorsten and other major figures within the IADC, Justin and other leading Full Sings, none of them seemed to want authority for themselves. When he'd gone so far as to point this out to Justin, he'd simply shaken his head and declared: “No one has the wisdom to rule over others.”

Robert Reynolds would not be quick to contradict that self-effacing judgment. He had seen too much in his lengthy career in public service. He knew his own faults and weaknesses. The laws of unintended consequences had finally caught up with him, despite his lifelong idealistic race to stay ahead of them. Yet he still couldn't extinguish his fear of the idea of nobody ruling at all.

He looked sadly at his wife, and wordlessly put his arm around her shoulders. Marguerite smiled and leaned close to kiss the side of his face. He couldn't imagine doing this without her. A lifetime of service, come to this. Failure. Defeat. Rejection. The antique pen in his pocket was not, of course, inked with his own blood, but it might as well be.

It was time. He dropped his arm off his wife's shoulder and started forward. She followed. Today's bill signing was taking place in the Federation's capital city of Chicago, which had been chosen as such due to its geographic position more or less central to the continent's population, as well as the unwillingness of any of the three constituent nations to see one of the others' former capitals become the new center of government. The

enormous park on the shores of Lake Michigan was packed as it had not been in a long time, as was the surrounding city. Few events in meatspace drew these kinds of numbers anymore. Perhaps a million people were on hand to witness this historic moment. Millions if not billions more would doubtless attend reenactments of it in cyberverses simulations over the years to come. Reynolds had never had such an audience in his entire career.

As his tall, silver-gilt frame emerged from the pavilion and began crossing the field to the raised stage, a cheer went up. His path was lined with media types, and government dignitaries, most of whom he knew, clinging to the last moments of their dignity. In no particular hurry, he paused to shake hands and exchange pleasantries with anyone he knew. He had donned his politician face, which made everything into a series of calm smiles and firm handshakes, polite words and light humor. He was aware as seldom before that he was an actor, playing a role to its finish.

At last there was no one left to greet, and so he squeezed Marguerite's hand for luck and courage, and stepped up alone onto the platform. It contained a table draped in Federation colors, with the Articles and a microphone resting on it, and a simple wooden chair for him to sit in. And of course, another microphone atop a tall stand at the front corner of the stage. He headed for that one at once, and stood behind it quietly, waiting for silence.

He looked around him at the crowd, wishing to engrave the scene in his memory. To his right was the lake, covered with boats as far as he could see. Before him, the sun was setting over the still-impressive Chicago skyline. To his left the crowd stretched, out of the park, up the downtown streets, hanging out of windows, clustered on rooftops. It was warm, and a bit muggy, but no longer blazing hot as it had been earlier today. The scents of hotdogs and beer, and the laughter of children splashing in the slowly curling waves, took him back to his youth. Once upon a time, such scenes had been the norm, on any important occasion in such a large city. Today, it felt like one last hurrah, a final gathering after which only

nostalgia would remain. *Change is the way of all things*, he reminded himself.

At length the exuberance of the crowd died down, and Reynolds judged he could begin. He'd attempted to prepare an oration for this occasion, but had given up on it as a bad job long before he was satisfied with it. He understood in his heart that these people were here not to listen to him, but merely to witness the spectacle of the victory of a people who had successfully withdrawn consent from their government, and – so far at least – declined to give their consent to another. Like a defeated general signing an instrument of surrender, he had no choice, really. But he was not about to remind them of why they didn't like politicians, or exhibit any sour grapes, or say anything just to save face. Any speech he gave would inevitably get sound-bited down to only a few key sentences anyway.

So that was all he was going to give them.

“My fellow North Americans,” he began solemnly, and then paused while a hush fell. “Democracy has been the practice and the watchword of enlightened governments for centuries. Today we are gathered here not to part ways with democracy, but to acknowledge its supremacy. The people of this continent have spoken, with an overwhelming voice that we, your public servants, cannot fail to hear, or to obey. The times we live in have changed, and will change even more in the years to come. As the American Declaration of Independence stated long ago, it is the right of the people to alter or abolish their government. And so it is that the North American Federation today reaches its end. The task of designing new safeguards for their future safety and happiness now returns to the people.

“It has been my honor to represent my district in the Senate since the inception of the Federation. And my even greater honor to serve as its acting-President over this past month, following the tragic deaths of the President, the Vice President, and the Chairman of the House. This trust was placed in me with the understanding that I would lay down my position as soon as the people elected a legal successor. It is now plain that the

people have selected no one but themselves. Therefore, it becomes my duty and my privilege to perform the following act.”

Without further ado, Reynolds slid smoothly into the seat behind the table, pulled out his old ink pen, uncapped it, and laid it beside the document. Cheering began, and the chanting of slogans, but they slowly died away as he picked up the parchment and thumbed on the desk microphone before him to continue.

“From the earliest days of jurisprudence on this continent, it was established that governments manifest their existence as legal corporations with special powers. Therefore, in recognition of the demands of an overwhelming majority of the shareholders, and in accordance with the unanimous resolution of the members of Congress acting as trustees and directors, I, Robert C. Reynolds, acting chief executive officer of the corporation doing business as The North American Federation, do hereby affix my signature and seal to the Articles of Dissolution dissolving the said government corporation.”

And with that, he picked up his pen, took a deep breath, and signed his name with a flourish. Even before he rose to his feet, the cheering and celebrating began. He remained briefly on stage, smiling and waving with both hands to the multitude. He saw thousands of signs being waved bearing various slogans and emblems, everything from “Don't Tread on Me” to “1945-2045: Never Again!” A chant of *never again, never again, never again!* rose through the crowd and then died back down, but most of the celebrants were simply jubilant.

Reynolds, senator no longer, retreated from the platform, hugged his wife, took her hand, and slowly began making his way out of the crowd. It wouldn't be all bad, being a private citizen once again, he reflected. He glimpsed Justin standing along the way with some of his associates, applauding him. *Well done, Robert*, he mouthed silently. Reynolds smiled back. He supposed Justin had foreseen this all along, when he'd rescued him so that he could make the important choices he'd said were ahead of

him.

More importantly, he'd also given him back the love of his life. Marguerite was a miracle, of God, of science, and of herself. A life with her in it could not frighten him, no matter what else he had to give up. Would he someday go the distance and become as she was? He couldn't tell, though he did know that the more time he spent there, the more he understood that the future of the human race was in the cyberverses, not here in meatspace. One single world, no matter how treasured or how it might be perfected, could not fulfill all the needs of humanity.

"How do you feel, Robert?" she asked him gently now.

He stopped and looked at her. He took a deep, refreshing breath, held it, let it out. "I feel that from now on, there will always be more beginnings, than endings."

She smiled her understanding and agreement. The former first couple made their way across the park, greeting well-wishers and laughing with old acquaintances. Today, this part of the world had finally been set free. And so had they.

In religion, precise truth has almost no currency. True believers will kill and destroy to defend their inaccurate beliefs. And that is a truth upon which you can rely.
-- [Glen Cook](#), *Water Sleeps* (1999)

Chapter 52
Sins of the Father

Cylara and Daniel dismissed their robotic air taxi in the front yard of the Cleary estate. It took off with a muted rush of air and a whine of engines, and arced over the pine trees, humming away westward, presumably to its next customer. Daniel looked around the yard briefly. He had not been here in more than a month. The drying weeds of summer were going to seed under the fences. The lawn around the house was mowed and the hedge along the garage was recently clipped, suggesting that the maintenance staff was still on the job. (The senior Clearys would never employ robotic gardeners.)

The house was large and rambling, with a two-story front facing the circular drive, and a wing running back from each end, forming a 'U' shape with an inner garden nestled between the wings. The house still had wooden siding, which could really use another coat of white paint, if not before winter then certainly by next spring. Drapes were drawn over those windows they could see, which mostly faced west, to keep out the hot Idaho afternoon sun. Everything looked closed up in fact, but Daniel was pretty sure one or the other of his parents must be home.

There was an immense dog run, over by the barn opposite the house, and one of their Newfoundlands stood at the gate, wagging its tail and emitting a friendly bark in greeting. Torch waved at the dog, which he thought he recognized, and which appeared to recognize him.

"This is where you lived?" Cylara asked, looking around her with interest.

"Grew up," Daniel corrected. "Haven't actually lived here since I was nineteen. Mum still keeps a room for me, though." He thought: *Now who's interested in meatspace living arrangements?* But he said nothing, not wishing to revive an old argument. Being here again did not make him

happy. He was here because he needed to be, because he had something to do. He'd rather be back at the virtual ranch resort, or indeed, almost anywhere with Cylara. And they had anywhere and everywhere available to them to share. He could scarcely understand how he had ever wanted to have her in a place like this, and *only* in a place like this. She looked around curiously, but said no more, obviously respecting his mood.

There was nothing for it but to get it over with. Daniel walked up to the big brown door of his family home resolutely, and punched the doorbell twice. After a minute or two of waiting, he exchanged a glance with Cy and dinged it again. Still no answer.

"I'm sure they must be home," Daniel muttered. "Sometimes dad can't hear the doorbell in his study. It's near the back of the north wing. Maybe they had to let the servants go." He supposed that the Federation's collapse, formalized by ex-President Reynolds three days ago, had probably hit his family pretty hard financially. He pulled out his house key and fitted it in the lock. Ringing the bell was primarily a courtesy, made since he had not come alone.

The house was cooler than the summer day outside. The hardwood floors were brightly polished, the walls an off-white only slightly darker than those outside. Real wooden furniture greeted their eyes in the form of an upholstered settee, an inlaid coffee table, and some coat and hat racks in the foyer. There was also an old-fashioned guest book lying on the table, bearing many signatures, marked open with an ancient fountain pen. More wooden end tables graced the halls in both directions, supporting ceramic lamps with fine embroidered shades. The terminus of a curving stair stood nearby, leading upstairs, with a carved and polished banister. A reproduction of da Vinci's *The Last Supper* hung over the settee, and below that an embroidered piece of old linen in a glass frame reading "Bless This House."

Cylara sucked in her breath. "Everything here looks genuinely pre-nanotech."

Daniel nodded. "Yep. My parents won't have anything molecularly manufactured in the house. A cook helps my mother prepare all the meals by hand. And I'd better warn you, my dad wears glasses."

She laughed musically. "I'd heard that, but wasn't sure whether it was just a rumor."

"Nope, that's dad in a nutshell."

She shook her head, marveling. "I haven't seen a house like this since I was in my teens." Acting on a sudden impulse, she stepped forward and quickly scribbled her name in the guest book.

"I've *never* seen another house quite like this one," Daniel agreed glumly. He rolled his eyes at her antic with the guest book. "Come on."

He led her to the left, through a long dining room with double doors behind it that must lead to the kitchen. A kind of family room followed that. Then there was another stair at the corner, which Daniel climbed. This one was carpeted. They emerged at the end of an upstairs hall running at right angles, and Daniel started down it without a word. They passed several closed doors on both sides, which might be guest bedrooms or something. Due to all the closed doors which blocked the natural light, the hallway was a little dim. There were however a couple of skylights along the way.

Near the end of the passage, Daniel paused in a doorway to the left which was open, and rapped his knuckles on the door frame. Cylara moved to stand next to him, looking in.

A man was sitting alone in what was obviously a study. There was a large oak desk, stained a dark reddish brown. Shelves of books lined two walls. Paintings and framed photographs of family, friends, or religious subjects covered much of the space on the others. The window was closed, but its lace curtains were open to let in the north light. Despite this, there was a reading lamp activated on the desk. Its pool of light fell on a pile of pages with actual handwriting on them. The man in the plush, leather high-backed swivel-chair behind the desk was looking up at them with a neutral expression, and sure enough, he wore glasses, that seemed to make his blue

eyes look a touch larger. Cylara could see the family resemblance, though this man's auburn hair was graying and worn shorter than Daniel's, which was brown. He had the same handsome, pleasantly masculine strong lines in his face. His expression through his glasses was not particularly welcoming, his lips pursed into a thin line. Oddly, he wore a colorful tie. *Who wears a tie alone in his own house?* Cylara wondered.

"So, Daniel, you've come back."

Daniel jerked his thumb over his shoulder. "No one answered the door," he said, keeping his tone casual.

"Yes. Well, we don't have full time staff here any longer. We can no longer afford it, as I'm sure you can well imagine."

"Right. The Federation breakup and all that."

Cleary senior flicked his son a glance that this time clearly carried disapproval. "The Federation broke up because Roger Sarner died, and he was the only man who could hold it together. Sarner died because you abandoned him. I have my sources and I know the story."

"Sarner died because he did something stupid, father," Daniel said contradicting him, which Cylara sensed was not something he'd done very often. "He did a lot of things that were stupid. I should know, I had to put up with them for weeks."

"And yet, despite being so much smarter and wiser than the late Homeland Security Secretary, you return to me empty-handed. But not alone. Who is this woman with you?"

Cylara was not about to let Daniel introduce her to anyone who spoke in such a peremptory tone, and was rude enough to ask who she was in the third person. "I'm Cylara Janovic, Mr. Cleary," she said pleasantly before Daniel could open his mouth. "I'm Daniel's – what did they used to say? – significant other."

"Cylara, this is my father, Maxwell Cleary," Daniel said politely, completing the introduction with a gesture.

"The degree of your significance is certainly interesting, Miss Janovic,"

the Reverend replied, speaking to her directly for the first time. "Are you the reason why my son has abandoned his holy mission?"

"But I didn't abandon it, father," Daniel said quickly. "I've come to give you the List, as promised." He held up a flat plastic micro-disc, with its distinctive rainbow gleam.

His father raised an eyebrow at him. "Really. Well, it may come too late, but I suppose we'd better take a look at it, then." He opened a desk drawer and, somewhat to Cylara's surprise, pulled out a book screen reader. As Daniel approached and handed him the disc, he flashed Cylara a glance and spoke to her again. "Almost the only piece of computing machinery I permit myself, Miss Janovic. It is occasionally necessary for me to read screed originating from the other side."

Cylara marveled silently at the degree of distortion in this man. Just his few interactions with Daniel so far, and with her, his sheer domineering, snide assurance, gave her a fresh new sympathy for her lover, forced to grow up with this.

Reverend Cleary activated the reader and inserted the disc. He read in silence for a time, scrolling down a few pages. Then he looked up, nonplussed. "Is this in some sort of code? There are no names of virtualities here, or GPS coordinates, only the names of people."

"Special people, father," Daniel clarified. "People in past, present, or legend who loved one another."

"And what then is the significance?"

"How about that true love is a value which is universally shared?"

Maxwell shook his head. "Don't start with your free love nonsense. I know what universal love means in the cybervers. It means that you can love anything that moves. I see that the author of your celebrated lover's list here, has included what I can only assume are gay couples. For example," he said pointing down at the screen, "here we have Frederic Chopin and George Sand."

"There are indeed same-sex couples on that list, but George Sand was a

woman, father," Daniel said with a smile.

"A writer," Cylara added. "That was the masculine pen name she had to use to get published. I admire women like that, and I hope that someday I might get to meet her." Daniel shot her a cautioning look.

The elder Cleary's face clouded for an instant, but he did not argue the point further. Instead he set down the reader and looked up at his son. *Now he will attack on another tangent*, Cylara predicted silently. She was not disappointed.

"This so-called List is merely worthless data. What has become of the real Master Node List?"

"Father, it never existed. It was a ruse. The Sings told us what we wanted to hear, so that we'd chase our tails in the cyberspace instead of doing something more effective in meatspace. And it worked. By the time I finally managed to get hold of that List – and I assure you, that one there is the only one there is – it was too late. The matter patterning breakthrough had been achieved."

"So you believe this nonsense about computers without computers, in rocks and trees?" Cleary challenged.

"Yes, because it's not nonsense," Daniel answered steadily. "It's true. It's real."

"Your war is over, Mr. Cleary, can't you see that?" Cylara put in.

He gave her an openly hostile glance through his spectacles. "Oh no, miss. The Devil is always quick to proclaim victory, in order to tempt the faithful to give up the struggle. But there is still a victory to be won."

"How, father?" Daniel asked, pleading calmly. "The government is gone. Other governments around the world are said to be teetering as well. If we torch a single computer anywhere, the Cyberantes will be all over us. We can no more fight them than jump over the moon. And pretty soon it will make no difference even if we could somehow destroy every piece of identifiable computing hardware in the world. There's no way left that the Order can win this struggle, father."

Reverend Cleary smiled a cruel smile, more chilling than any display of rage. "You don't think that God can win it, Daniel?"

His son looked exasperated. How had he ever been so influenced by this man? "I think that for sure, divine intervention is the only thing that could," he agreed amiably.

"And so our duty should be what?" Cleary asked mildly, like one encouraging a dull student. Both Daniel and Cylara looked at him quizzically.

"I don't know dad, though I'm certain you'll tell us."

"Why, to pray for exactly that of course. For divine intervention," he explained calmly.

"To pray for the end of the world?" Cylara asked, with plain disbelief.

"Precisely." Reverend Cleary steepled his fingers on his desk before him, radiating conviction. "Do you know what this is?" he went on, glancing at the document he'd been working on writing when they arrived. "Of course not, so I'll tell you. It's my Epistle to the Faithful. A letter, to all the Christian Moshes left in the world. Like the apostle Paul, we have fought the good fight, we have finished the course. And there is for us a crown. When enough of us join in prayer, this fallen world *will* be destroyed. And the Faithful *will* be redeemed, and lifted off it into heaven."

Madness is all he has left, Cylara thought sadly. Aloud she said: "I don't want the end of the world, Reverend Cleary. I like this one just fine, and I wouldn't miss its future for anything."

Cleary nodded to her, eyes twinkling. "I see. And does your young woman speak for you as well, my son?"

Daniel swallowed hard, then said the words he'd really come to say. "I'd have to agree that she does, sir. I tried hard to achieve what we set out to do. But we lost, and it's out of our hands now. And to be honest, I don't think the Rapture is going to come down no matter how many people pray for it."

Maxwell Cleary sighed wearily, then deactivated the reader screen, slid

open his desk drawer and replaced the reader inside it. "I'd hoped for better from my own son, I must admit," he said as he did so.

"I'm sorry if I disappoint you, father. But I think it's time I made my own life choices now."

"Indeed, you should," came the serene reply, and then there was a small sound, like a cross between a chirp and a thump. Daniel sagged sideways against Cylara, with a gasp of indrawn breath. She supported him as he crumpled to the floor, an expression of surprise on his face. Scanning him anxiously, she noticed a tiny, feathered dart sticking out of his shirt front. Rising, anger welling up in her mind, she looked at Daniel's father and spied the small black dart gun in his hand, held just above the desk blotter. He must have drawn it from inside the drawer even as he finished replacing the reader.

Cylara's mind went hot with fury, and her body tensed and coiled. Father or not, the Reverend was about to get a brief taste of her Cyberantes hand-to-hand training. Then her vision swam as a second chirp-thump was heard. She managed to brush the dart out of her shoulder before she staggered and fell into a heap beside her lover.

"I know all about your fancy nanite implants," Cleary said with icy calm. He was too calm, too cool, he was so crazy, she should have seen it immediately. "I'm sure you could take me apart in about two seconds flat, couldn't you my dear?" he asked rhetorically as he stashed the dart gun back in his desk and slid the drawer closed again. She found she could not speak. Beside her on the floor, Daniel gurgled something unintelligible.

Cleary came around the desk to stand looking down at them, but again, spoke only to Cylara. "But not once your excellent enhanced circulatory system has been flooded with a potent neuro-toxin. You've taken my son from me. I'd like nothing better than to cut your pretty throat and watch you bleed to death slowly – but I've no illusions about that being fatal, either."

He stepped around them and walked out into the hall. She heard him

open a door opposite. Then came sounds like a case being unlocked, a hinged door swinging, and something rattling. There were more sounds like drawers being slid open, and some metallic clicks. Cylara struggled valiantly to raise her head but could not. It was like being paralyzed. At last, with a convulsive spasm of effort, she managed to twitch her legs just enough to roll her body flat onto her back. She had knocked out the dart, and knew that her medical nanobots would already be hard at work neutralizing the poison, removing its toxic molecules from her system. She felt weak and queasy, but her vision just might be clearing a tiny bit.

Abruptly Maxwell Cleary's suit-clad legs marched back into her field of wavering vision. And something else was dangling by his knees, something like twin grey tubes. What was it? As she strove to focus, a recoiling shock twisted through her belly as her brain identified the object as a shotgun barrel. Desperately, she tried to flex her fingers, but they only trembled slightly. Daniel's dart was still in his chest. This was going to be up to her.

"My, you seem to be recovering quickly," his voice said with mock admiration. "Oh, I see. Removed the dart, didn't you?" She gagged out something that she hoped would sound like an attempt at speech. Her only chance was for him to wax philosophical, attempt to justify himself, preach to her, give her absolution, anything that would waste enough time to let her recover a bit more. Perhaps only for a minute or two. She felt like she could almost move, but didn't want to let him see her try it until she was ready.

"Oh, I'd love to continue our discussion, my dear. I'd love to find out whether you can manage to remain a godless atheist with death staring you right in the face. I'd love to spend time telling you exactly what I think of bleached-blond, capped-teethed, painted, siliconed, open-thighed sluts like you and what they do to good men's reason. But with that dart out, I don't think that would be wise. So it seems all I have left to say to you is: may God have mercy on your soul. If you do manage to repent in your last moments, He'll know, and perhaps He will."

And with that he brought the shotgun up to her face, almost close enough to make her go cross-eyed. Ready or not, it had to be now. With a growl and a grimace, she managed to reach up to bat the weapon's aim aside. Cleary stepped back hastily with a gasp of surprise. Desperately, Cylara rolled over and scrabbled forward, grasping drunkenly for the gun barrel. Reverend Cleary took another sharp step back into the doorway, brought the weapon up toward her face again, just out of reach, and pulled both triggers.

Blazing white light-

The sudden roar boomed in Daniel's ears, overriding the pounding of his heart between the walls of his skull, which was all it seemed he could hear clearly. There had been some mumbled, indistinct words, then this. At the same moment something slapped across his cheek and ear, something wet. His vision was narrowed down to a small circle, and now he seemed to see his father peering at him as if down a short tube. He was not looking at Daniel, but gazing down as if at something in his hands that he was fiddling with. Dimly, Daniel heard a sharp snick and then his father looked up and into his face.

"Your whore, Cylara, has gone ahead of you, my son," he said, while Daniel struggled groggily to make sense of the bizarre words. "Though I strongly suspect she may be going the other way," he added with a chuckle. Daniel suddenly realized that his father was holding a gun. Only after a slow moment did he come to associate that with the noise he'd just heard. No...

"As I feared all along, the cyberverser took you from me, Daniel," his father continued in that maddeningly soft, calm voice. "Because you were my son, I hoped you might be strong enough to resist the pull of the Devil's playground. And maybe you would have, had it not been for that woman there. Women are a temptation at the best of times. Speaking of women, your mother isn't here, she's visiting your aunt. I suppose that's just as well," he concluded with a weary sigh and a silent pause. "She might not

understand.”

He leveled the shotgun at Daniel so that he was now looking at his father along the length of its twin barrels. “But *you do*, don't you Daniel my son? It's my fault. My sin, really. I set you on this road. It was pride you know, a father's stupid pride. I thought you were strong enough, but no one is. That's why we have to live as God made us, completely human. I almost cost you your immortal soul, Daniel. I'm so sorry. You said you tried, and I know you did. I'm sure you gave your best. I know you wouldn't do anything less, for me, or for God. But it's clear you can no longer pull yourself back, not as long as you live in this hateful, sinful world.”

Daniel lay there, realizing belatedly that his old man was working up to killing him, just as he'd killed Cy. Oh, God, not Cy! She didn't deserve this. Maybe he did for his lies and confusion, but not her.

“I know there's a part of you, Daniel, my sweet boy, that's ready to go home. I speak now to that part. Repent your sins, walk with the Lord, and go into the Light. I love you, son. We'll meet again after the Last Day, and live together forever in the halls of our Father.” For just a moment his voice broke. Then it regained its steadiness as Cleary got out the final word: “Goodbye.”

There was so much Daniel wanted to say, to shout, but his speech mechanism simply would not obey him. He couldn't even turn his head. *Into Thy hands, Lord...* he thought, and it was the most ironic thought of his life.

White light-

Reverend Cleary stumbled to his knees, almost as if he'd slipped on the blood-slicked carpet, but he hadn't. The empty shotgun fell from his hand which could no longer hold it, while a loud moan warped out of his chest cavity, abruptly cut off as he was jolted by his knees' impact with the floor. Panting, he stared at his right hand, which he held out levelly before him, its forefinger still curled as if angled into an invisible trigger guard. The hand shook and vibrated as if palsied. He drew in sharp, rapid breaths until

the hand – was it really his? – stopped shaking. Then he braced his palms on his thighs and stood up with a grunt.

One of the lenses in his glasses was occluded, and he pulled them irritably off his head and set them down on his desk. Specks of red and white, like mucous, adhered to the lens, and now to his fingers. He forced himself to look down at the bodies. God, what a mess. He'd never actually seen anyone killed with a double shotgun blast before.

He checked his watch. Nearly four. The days were long. He'd have time if he started now. There was a wooden chapel out in the woods east of the house. There were graves beside it, old family graves. In the maintenance shed near the chapel there were shovels, and tarps for carrying the bodies. There was even a marble headstone, awaiting incision with the name of the next member of the Cleary clan to pass on. Never thought that would be Daniel. But he couldn't mark the grave yet, no not yet. Later, when he'd had time to break the awful news to his wife, and they could do a proper private funeral.

Yes, that would work. And on the far side of the chapel, out in the woods, another grave, for her. Even the whore of Babylon deserved a decent burial. And then? What was he to do about this carpet, this whole study? Set a fire? Maybe, but he had no wish to burn down the entire house. In fact, better wrap the bodies and drop them out the window into the flowerbed. Otherwise the gore would track all through the house. And the first thing he'd better do along those lines, he thought as he looked down at his pant legs with disgust, was change his clothes and shoes.

Calm again, Maxwell Cleary sprang into action. He picked the shotgun up off the floor, wiped it off, and restored it to its place in the gun case in the adjoining room. Then he took off his shoes and headed for his bedroom.

He had a lot to do, and he felt a surge of intense nervous energy that he knew from experience would carry him all the way through his tasks. It seemed that God at least understood, and perhaps even forgave him for what he'd had to do. But after all, why shouldn't he? Wasn't Daniel with

Him now? *Thank you, Lord*, he thought humbly.

Oh, for sure he'd better remember to remove his Epistle from the study before he started any fires. He'd just gotten to the part about the need to sacrifice whatever you held most dear in this world. Who better to write that passage than himself, who had just sacrificed his own son? Even God had had to do that once. Maybe he'd be able to finish it tonight, or at least that section.

As he hurried along the hall toward his room to change, he knew better than to expect that he'd be able to sleep.

And though worms destroy this body, yet in my flesh shall I see God.
-- Job XIX, 26

Chapter 53
World Without End

Clay waited impatiently for Salma to arrive. Her last PM had said that she would be there in a moment. Probably she was picking out clothes or something. He snorted to himself. Even when clothes were virtual, you still had to wait for women to get dressed.

He stood pacing in the game room of his new house. There were old-fashioned love seats, sofas, and other comfortable furniture lining the walls, with card and pool tables stationed in the middle. A set of French doors led out onto the flagstone patio. The weather outside was the best that southern California had to offer, unless he chose to change it.

Abruptly, Salma appeared out on the terrace. He called her name and she turned toward him and stepped inside. She was wearing a sort of ruffly medium-length dress in a shade of light green, topped off by a Spanish shawl. Her shoes were just tall enough to shape her legs, without adding much to her height. As always, he found himself appreciative of how sexy she always managed to look even in clothes which were not revealing.

"All ready!" she announced cheerfully, giving him a playful kiss.

"You look nice," he greeted her. "One of hers?"

"Of course."

"Let's go." She offered him her hand, and he took it and keyed the zone sequence he had already programmed.

They appeared in the circular drive of a large, sprawling mansion made of aged brick, built all on one story, but with wings running in four directions, dividing gardens planted in between. The front doors were propped open, and faint partying noises could be heard drifting outside from within. The late spring day was warm and fine.

Salma and Clay walked up the broad, shallow steps to the front door and

stepped inside. It seemed dark compared with outdoors, probably because of the dark stone parquet and mahogany paneling in the foyer. The double doors leading into the garden on the opposite side of the entry hall were also flung wide, and it was from out there that the noises wafted.

“Welcome! Good of you to come,” said a woman's voice. They turned and saw a dark-haired young lady walking toward them down one of the halls, and recognized her at once as Cylara's Paia.

“Thank you,” Salma responded politely. “How are you, Paia?”

She smiled happily. “Oh, everything is pretty much back to normal now. My mistress is outside in the gardens with the other guests.” Paia gestured for them to walk on through.

“Thanks,” Clay murmured as they stepped past her into the garden, which lay in the V between two spokes of the house. There were lawns bordered by shrubs and flowerbeds and dotted with shade trees, with statuary positioned here and there, a number of ornate painted metal tables surrounded by chairs, a couple of fountains, and a gazebo. The house belonged to one of Cylara's relatives, probably an older one by the look of it. There were a number of people laughing and talking in and around the gazebo, many holding drinks or plates of snacks, or both. Hand in hand, Clay and Salma strolled in that direction.

As soon as they climbed the few stairs into the gazebo, they could see their friends standing in the center of the conversation. Salma sprang over to Cylara and gave her a big, sisterly hug. Clay contented himself with handshakes, first with Torch and then with Cy as she and Salma broke their embrace. Salma leaned up to give Torch a peck on the cheek.

“Good to see both of you,” Clay offered casually.

“It's good to be here,” Cylara replied warmly.

“Thanks for putting out the APB on us, man,” Torch said to Clay. “Thanks to you, we only missed three days of our lives.”

“It was Cy's Paia who told us you guys were missing,” Clay allowed modestly. “After that, I put some folks from the company on it. We were

pretty shocked when they told us--”

“That we were both dead and buried out back of Torch's parents' house,” Cylara finished.

“Well, yeah,” Clay admitted with a laugh.

“It was pretty shocking to us too, I gotta tell you,” said Torch. “Justin even warned me in so many words that his beliefs could make him do murder. But dude, I still never thought my old man was quite that crazy, to try and kill his own son.”

“I'll bet not,” Salma agreed. “What was it like for you guys, if you don't mind my asking? About like it was for cousin Art?”

Torch shrugged. “Yeah, about. As you know, I used to have doubts about whether you came back as a complete soul as it were. But not anymore.”

“Except that the Scanner is now operated by an AI, a program called Brunnhild, after the Valkyrie in Wagner,” Cylara added with a smile. Everybody laughed.

“You didn't have any legal problems?” asked Salma curiously.

Cylara shook her head. “No, not really. We still remember all our personal access codes, pass phrases, and the like. Paradise Systems supplies an affidavit stating the origin of the Scanned person, and that seems to be universally accepted now, unless there's some specific dispute as to one's identity.”

“So what will you guys do now?” Clay inquired.

“Oh, pretty much what we have been,” Torch replied easily. “I just won't be doing so many jobs in meatspace,” he quipped.

Cylara smiled broadly, looking past her two friends. Torch waved. Clay and Salma turned to see Justin and Riksana walking up the steps together. Salma was immediately certain that Riksana's dress, a long, elegant white sateen wrap that fitted her like a body sleeve, was likewise one of Cylara's creations which she had worn to honor her.

More social niceties followed, including Cylara introducing Torch to

Riksana, whom he had never met in person before, and Riksana introducing Cylara to Justin. Cylara had confided to Salma some time ago how Riksana had taken time out from her busy schedule to help her figure out what was going on with Torch. Once they'd found out, she had also given her good advice on how to turn Torch back into one of the good guys.

"I truly wish that you'd waited a bit longer to confront Reverend Cleary," Justin said to Torch and Cylara together. "A few days hence and you would have been spared such a distressing experience."

"A few days?" Torch asked. "What happens in a few days?"

"The Reverend becomes rational?" Cylara guessed. "Nah." She waved a hand dismissively.

Justin grinned. "I regret, we all have to limit ourselves to what is actually possible. No, merely the deployment of a little something to keep the Moshes from doing any further harm. Something that's now possible because of matter patterning."

"And which won't harm them?" Salma wondered.

"Not a hair on their heads," Justin affirmed. "In fact, although it's not a duty I look forward to, I suppose I should really meet with the Reverend myself before long. Mad he may be, but he still carries a lot of influence within the KOJ and among religious conservatives generally. There are some, shall we say, new realities which I should really explain to him so that he can pass them on."

"Better wear one of our Cyberantes combat suits," deadpanned Clay.

Justin chuckled. "Oh, that shouldn't be necessary. But what I would like, if you two were willing, is for both of you to accompany me on my visit, at least briefly." Everyone looked at him in shock, almost as if he'd suddenly drawn a gun of his own.

"You want us to go back there again, to see the man who tried to kill us?" Torch demanded, incredulous.

"To give him a piece of our minds, I suppose?" added Cylara.

Justin turned up his palms in a gesture of uncertainty. "You could, of

course. But really, if you wanted to annoy him I can't think of any better way to do that than to turn up like Banquo's ghost, let him see that you're alive again, and tell him you forgive him for attempting to murder you."

Cylara was now smiling with wry appreciation. "That *would* frost his cookies, I'm sure. But really, I don't give a damn what that asshole thinks." Riksana pantomimed clapping her hands.

"Nor do I, I must admit," Justin went on. "But while we can simply put out cyberverses press releases announcing what we're doing, there are certain aspects of it which really need to emanate from inside the enemy camp as it were, in order to be most effective. And the easiest way to achieve that is to let Maxwell Cleary be the source of it."

"Why isn't the bastard in jail?" Clay said indignantly. "That's what I want to know."

Justin looked at him earnestly. "Because he didn't kill anybody. And while he most definitely did commit a violent assault, the two victims of that attack have yet to lay any complaints, unless I'm mistaken."

Cylara and Torch exchanged a glance. "We didn't think it would do any good," Torch explained, almost apologetically. "I mean, suppose we show up perfectly unharmed in new meatspace bodies, walk into some sheriff's office somewhere and say, 'Hey Sheriff, this crazy old coot blew our brains out with a shotgun.' Who's gonna believe us?"

"It is unusual, to say the least, for the alleged victims to present personal testimony in a murder case," Justin agreed. "Even your bodies would not be conclusive evidence. Evidence that *someone* was killed perhaps, but not necessarily someone who was you, especially given that bodies can be copied. And since no one *else* died either, well, who is there to file the complaint, as you say? The fact that you signed the house guest register, Cylara, does put you on the scene on the day of the supposed crime, but doesn't do much beyond that. Cleary could even claim that the entire thing was an elaborate hoax, with himself as the victim, and assert that he knows nothing about the bodies buried behind his house or the cause of the fire

which devastated the north wing.”

“What about evidence provided through the Cronus Scanner?” Riksana suggested.

“Not admissible in a Mosh court,” Salma demurred. “Given the simulation capabilities of the cyberspace, any evidence originating from there would be suspect.”

Justin concurred. “The Mosh investigators would require witnesses and evidence from meatspace, subject to corroboration and cross-examination. It would boil down to his word against theirs.”

“And there's known to be bad blood between the father and the son over the girlfriend,” Riksana concluded. “So, motive for making false accusations.”

“Which is exactly what my dad would probably say if we accused him,” Torch agreed. “So, we haven't yet and we probably won't bother.” He paused. “If we came with you, we'd need to get meatspace bodies again, wouldn't we?”

“Yes,” Justin answered. “Foglet ones are also available, but a little harder to manage, first time out. There's an excellent MM factory for cellular bodies in Beijing, and you do of course have the original molecular specifications.”

Cylara burst out laughing. “Should we wear dog tags saying 'Made in China' to attest to the quality?” Everyone laughed along with her, the vibrant mood of the gathering restored.

“Of course not,” said Justin. “But you'll find that a recreated cellular body feels almost indistinguishable from your original one, depending of course on how you choose to customize it. With the notable difference that you won't be doing much actual cognition using its brain.”

Cylara made a little sound of scorn. “That's no big loss. I wonder how I managed to get by for so long, thinking at that speed. And that slow, unreliable memory. As a matter of fact, I'd been thinking about going the Full Sing route for months now, and I feel like such a loser that I didn't do it

sooner.” She suddenly seemed to focus on Salma and Clay with a start. “Sorry guys, I didn't mean to be offensive.”

Salma shook her head and took Cylara's arm. “No offense taken. If you're saying you're better than ever, we're happy for you, aren't we Clay? We might even take the big step ourselves someday. By the way, we've picked a date for our wedding, middle of next month, and we're going to do it in virtuality of course, so that all our friends and family can come. Speaking of which, can I steal you away to have a chat about my wedding dress?”

Cylara smiled conspiratorially and said of course, and the two women excused themselves. Torch was still standing as if lost in thought. “You know,” he said after a moment, “I do feel like my confrontation with my father was left incomplete. Maybe I will go with you, even if Cy doesn't. When would you want to do it?”

Justin shrugged, exchanged a glance with Riksana. “Oh, no rush, in a week or two.”

“You're going to have to brief me on what these changes are, beforehand.” Clay made a me-too gesture.

Justin's eyes twinkled. “It's a surprise. But you're right, and I will.”

Riksana laughed and rolled her eyes. “And then, finally, we'll have more important things to do together.”

Justin gave her a kiss. “You can count on it, love.”

The significant problems we face cannot be solved at the same level of thinking we were at when we created them.

-- [Albert Einstein](#) (1879 - 1955)

Chapter 54

Asymptopia

Justin walked up the graveled road toward the Cleary family house. A rain shower earlier that afternoon had failed to obliterate what were indubitably tire tracks in the softened ground. The lane leading to the house branched off from what was formerly a paved county road, about half a mile back. The tracks were proof that the Clearys had visitors, or went visiting, by ground car. Primitive but not especially surprising. He'd debarked from his air taxi back near the junction with the local road, so that he could enjoy a stroll through the late summer woods in his cellular body, and approach the house more discreetly.

The buildings came in sight as he topped a curving rise. That one looked like a barn or stable, and the other wooden structure across from the main house resembled a garage or workshop. The forest chapel, according to Torch's helpful description of the estate's layout, would be invisible behind the dwelling. As expected, dark soot stains besmirched the exterior of the house on its northwest corner, attesting to the flames that had gutted some of the rooms on the north side; most of the damage was probably invisible from the front. Torch had also indicated his belief that the extinction of the Federation and its currency had badly damaged the family financially, and that consequently most of the servants and groundskeepers would have been let go.

Sure enough, as Justin walked up the drive, he saw that the door to the garage stood open, and a man bending over some piece of machinery in front of it appeared to be Maxwell Cleary himself. Perfect. That saved him having to ring the bell and convince the fellow to come out and speak to him. As he drew level with the building, Justin could see that Cleary was applying a wrench to what looked to be an antique riding mower. Amazing.

"If you want to cut the lawn, there are easier ways these days, Reverend," he said by way of greeting.

Cleary looked up through his glasses, focusing on Justin without a trace of recognition. "The trouble is, friend, all those other ways cost too much, in every sense," he grumped. He set down his wrench on the tractor's seat and walked forward, wiping his hands on a rag. He extended his right one toward Justin in greeting, which the visitor accepted and shook. "You appear to have the advantage of me."

"My name is Justin Turrell," Justin offered matter-of-factly.

Cleary dropped his hand as if it were hot and stood dumbfounded, the rag falling to the ground. He took in Justin's casual plaid shirt and utilitarian jeans, western style leather boots, short sandy blond hair, light eyes, and mild expression. The man looked like anyone you might see in these parts, more like a Mosh than some super geek freak.

"Well, no need to stand there gaping as if I'd just told you I was the Devil. I know who you are, and I assure you that I intend you no harm."

Reverend Cleary found his voice but spoke a little thickly. "In a way, you *did* just tell me you're the Devil. What do you mean, no harm? Haven't you done enough already?"

"Haven't you?" Justin returned archly. "But what I meant was that I'm not here to exact vengeance for anything you've done, or anyone you've killed – not even your own son and his woman."

Cleary flinched faintly at this, but did not respond to it. "Then why are you here, Mr. Turrell?"

"Please, call me Justin. I'm here to explain the precise nature of some new developments. I expect you've heard some rumors, funny stories, about strange occurrences over the past week or so? We're giving out press releases and news conferences in the cyberverspace of course, but we wanted to make certain that some direct, unfiltered communication took place with the Mosh community. Especially since the changes have certain metaphysical aspects to them, and that is, you might say, your area of

expertise.”

The preacher pondered for a moment, puckering his brow. “All right, I've heard some funny rumors, yes. But as for metaphysics, despite the ease with which the word comes tripping off your tongue, I doubt very seriously that your machine intelligence can even grasp such concepts.”

To Maxwell's surprise, Justin nodded pleasantly. “That most metaphysical concerns have their roots in the limitations of biology is an astute observation. But you would be mistaken to conclude that non-biological intelligence is not based upon, or perhaps one could more aptly say extrapolated from, biological awareness.”

Cleary sighed. “I don't want to debate metaphysics with you, still less theology. Why don't you just get to the point?”

“Okay. The point is this. One week ago on August the 15th, we deployed a new artificial intelligence program. We call it the Watcher. I got the idea for it when we were working on the energetic patterning of matter for quantum-networked computing. As you might have heard, that breakthrough allows for computing without a computer. It permits non-biological intelligence to utilize, or even inhabit, practically any existing matter, without necessarily reshaping it visibly, or chemically – though that sort of repatterning is now possible as well. This means that I could do all of my thinking in your lawnmower's engine if I wished, or in the foundation of your garage. Likewise, a virtual reality could now be hosted in your driveway, or in the roof beams of your house. You get the picture.

“Now the Watcher is a sentient program which spans the whole planet like a mesh, running on clumps of patterned computing matter scattered in a grid across every continent, even over the ocean floors. With the set networked together via quantum entanglement, so that the myriad pieces can communicate and coexist instantaneously, forming a single consciousness. Visualize if you will a fine mesh, like cheesecloth wrapped tightly around a globe.

“The Watcher has been given a purpose. Its task is to monitor all the

human beings on the planet, both Moshes and bio-Sings. It knows all languages, and similarly understands and can interpret body language, facial expressions, vocal stress tones, and common behaviors. It can even detect chemical changes in the body and brain – such as the sudden release of adrenaline, for example. It can monitor brain waves, which telegraph intentions whole seconds in advance. The purpose of this monitoring is simple: whenever the Watcher detects that one human being means to inflict a violent, non-consensual act upon another, it will use its matter repatterning abilities to prevent the act. For example, it isn't difficult to alter gunpowder so that it becomes chemically inert and will not burn. Or to cause a harmless momentary disruption in the body's nervous system so that a blow aimed fails halfway through.

“This Watcher AI does not exist to help *homo sapiens* in any other way. It will not save anyone from other forms of danger. It will not prevent quarrels that do not escalate to physical violence. It does not punish wrongdoing. It will not protect property. It cannot influence anyone's thoughts or feelings, and provides no knowledge or counsel to anyone. In fact it cannot even be communicated with. It is neither a benefactor nor a provider nor a teacher. It is programmed for one task only: to prevent men and women from deliberately harming one another. And that is all.”

Cleary was silent for a long moment. “And that is all,” he echoed finally.

“To be sure, it is simple but quite significant.”

“You could say that,” Cleary agreed, with some light sarcasm.

“You should rejoice, Reverend, that people will now have little choice but to follow the example of Jesus Christ. Or of Buddha, or Gandhi, or King, or Thoreau or Tolstoy or Einstein, of all of the humans across time who had the intelligence, the wisdom, to forswear the use of aggressive violence.”

“And would this include the Cyberantes?” he asked cynically.

“Of course. The Cyberantes have done an excellent job, by and large, of restricting their use of force to defensive purposes. They have generally done no more violence than need asked, and which could be morally

justified. But certainly, they too will henceforth be barred from the initiation of force. And without an initiator, the need for defensive or retaliatory force essentially disappears.”

“It's a breathtaking vision Justin, and it does indeed explain some of the weird things I've heard about lately. But just out of curiosity, what made you conclude that you had the *right* to implement such a scheme as this Watcher program?”

“It wasn't a question of our right, Maxwell. It was more a question of being derelict in our duty to our fellow sentients if we did *not* take this step. We Full Sings are the highest form of intelligence of which we are cognizant. And the indisputable fact is that we stem from a violent race with a blood-soaked history. In truth most biological humans are only marginally sane. The progress of humanity, and everything of beauty and meaning which has arisen from it, is attributable to that slim margin of sanity. To the triumph of reason and love, of compassion, of our better natures prevailing over that of the murderous, rapacious, driven beast. At the end of the day, we're fifty-one percent civilized and forty-nine percent barbarian; and all that we have, and know to be worthwhile, is the cumulative result of that slender two percent difference.

“The goal of nurturing that small net gain justified the historical development of both religious codes and secular laws. Standards of civilized behavior, and restraints on uncivilized behavior, attempted to promote the positive balance. And so arose religions and governments in all their various forms. But the problem with such social structures is obvious: those making and enforcing the rules and standards were seldom any more sane than anyone else; indeed frequently much less so, precisely because power over others typically attracts the more insane sort. Which consequently spawned wars and genocide, slavery and oppression, and all the famine, disease, want and suffering which follow in their wake. Billions have died, in the name of causes both just and unjust, in the name of deities of peace as much as gods of war.

“And so we asked ourselves: how could this Gordian Knot be cut? Our solution was elegantly simple: make violence impossible. Compel cellular humanity to find intelligent, peaceful solutions to its problems. Something which it's perfectly capable of doing, when it takes the trouble.”

Reverend Cleary harrumphed scornfully. “It still seems a bit high-handed to me.”

“Perhaps,” Justin admitted. “But no more so than any other solution that's been tried. In fact, it's a good deal less high-handed than any possible system of government. Consider that we could have gone further. We could have decided to rule the Moshes. To lay down a complex set of laws, of behavioral dictates. This is good, that is evil. Thou shalt, thou shalt not. And then used the Watcher to enforce them.

“But we chose not to. We consider that all such schemes interfere unduly with sentient free will. And in truth, just as you said we have no *right* to rule over anyone. Moreover, we have no *interest* in doing so, not even by proxy through means of an AI. So there is but a single Commandment which the Watcher enforces: *thou shalt not employ aggressive violence against another intelligent being.*”

Cleary was silent again as he digested the implications. “What about violence in the cyberspace?” he asked finally.

“A good question. There are those who hold that simulated violence is equally unacceptable. They point to the fact that even virtual acts possess a physical analog. It might amount to changing the state of a mess of bits on some digital media, rather than firing a hail of bullets across a battlefield, but a physical manifestation of the violence still exists. And so, they argue, cyber-violence is morally equivalent to meatspace violence, and should likewise be prohibited.

“The point that this argument misses is that virtualities have *policies* concerning violence, or the extent to which their visitors may experience it, and that entry into any given virtuality is a matter of informed, conscious choice. There are indeed worlds in the cyberspace which operate under

much the same regime as that of the Watcher here in meatspace, where violent acts are simply *verboden*. In others, violence can be exchanged consensually: if, for example, two people agreed to fight a duel. There are also worlds where violent strife is actually an integral part of the world's design. Virtuality mirrors all the aspects of human nature, not just those which would appear pure to monastics. But in no case is actual death inflicted, and anyone whose preference is scrupulously to avoid violent conflict can always do so."

"Actual death. What on earth would you know about actual death, Justin?"

"To be sure, our worlds see it differently. It's ironic, but only your people could convict you of the murder of your son. My people couldn't, because by our lights he isn't dead."

Cleary froze, his heart pounding within him. His mind raced around the obvious implication. At last he could no longer forbear to ask the question. "Do you mean that he...?"

"Oh yes. He was resurrected by what's colloquially known as the Last Trumpet Project."

A groan tore itself past Reverend Cleary's lips. "He can't be! He's with the Lord!" he cried.

Justin shrugged. "You may think so if you wish. Your son sees it differently. I've just signaled him, so he'll be here soon. They both will, both of your would-be victims. It seems they have something to say to you."

"No!" Cleary bellowed. "You can't do that. You've no right!"

"I'd say they have every right to confront you, after what you tried to do to them. But relax, Reverend. The eyes of the Watcher are upon us. They will not be able to harm you, whatever their intentions – or yours, for that matter."

An aircar appeared, winging in from the south. It set down in the driveway, a mere dozen yards away. The blasts of air ruffled their hair and clothes. Cleary wanted to get down on his knees and beg Justin to take

away this cup, this cup, do not do this! But it was too late, and he would not let his son see him begging that way. Even though it was not his son.

The door opened, and a man who looked exactly like Daniel got out, followed by the woman. The simulations were perfect, just as he'd known they would be. They advanced, and he made himself stand firm, impassive as they approached.

"Hello father," Daniel's voice said.

"You are not my son," he grated through clenched teeth.

"Fortunately for you, I am," Daniel returned. "If I weren't, you'd be a murderer, and you'd end up in hell eventually. I know you won't extend your life; you're too damn stubborn and you loathe yourself too much besides. So you'll die someday. I just wanted you to know that you don't have to die with me on your conscience."

"We're here to offer you our forgiveness," Cylara added sweetly.

Cleary's face registered an inner blow, but remained hard. "If you'd been paying attention when I taught you our faith, you'd know that my sins can all be washed clean in Christ's blood, with or without your forgiveness."

"True father, but only if you sincerely repent. Do you repent for trying to kill us?"

"No. I repent for the fact that I *did* kill you. Both of you," he said nodding at Cylara.

"But if you repent of what you did, then doesn't that imply you'd prefer to see us alive?" she asked. "Yet you're unwilling to acknowledge that we are. Seems to me you can't have it both ways, preacher man."

"I don't care how it seems to you," he said shaking his head.

Daniel exchanged an unhappy glance with Justin, who shrugged. "What did you expect, Daniel?" he murmured.

"I guess I hoped for some tiny recognition of reality."

"That can be expensive for religious believers, my friend."

"It looks that way." Daniel paused and faced his father squarely. "Father, I don't expect we'll meet again. For all the good things you gave

me, for life, and a home, an education, and all the ways in which you were able to love me as someone apart from yourself, I thank you. For all the wrong you've done me in my life, I forgive you. I want you to know I love you in my fashion. But you can't be a part of my life anymore. I wish now to take my leave of you. Goodbye." Daniel stuck out his hand to his father, who started to take it several times, but finally let his hand fall back to his side. Daniel Cleary shrugged nonchalantly, spun on his heel, and marched off toward the house, obviously with the intention of finding his mother.

"I'm afraid he'll probably tell the truth to your wife," Justin predicted. Cleary winced, and nodded.

"I hope she leaves you," Cylara said brightly. "I certainly would." She was silent a moment, as if seeking, and failing to find, anything more to say. "Well, I guess I'll go wait in the car." She turned as if to walk away. Then suddenly she spun around into a kick that did her Cyberantes combat training proud, snapping the blade of her foot toward Cleary's neck with enough force to shatter a fencepost.

The motion gave up partway through as her other leg on which she was pivoting collapsed beneath her, sprawling her awkwardly in the dirt. Cleary stepped back from her, shocked much too late. After a moment's dizziness and a groan which turned into a laugh halfway through, Cylara climbed back onto her feet. "Just testing, Justin," she said merrily, which he answered with a reproving glance. Contemptuously turning her back on Cleary, she strode back to the waiting vehicle and disappeared inside.

"So you've won," Cleary said, mainly to fill the yawning silence. "You've defeated us. The KOJ, the Federation, me, Sarner, you've beaten all of us."

Justin looked thoughtful. "It certainly would be difficult to form a new regime with the Watcher on the job," he mused. "Every act of authority, from the collection of the least penny in taxes to the enforcement of the smallest regulation, has always been backed up, if necessary, with deadly force. The fact that most citizens usually complied long before any actual force had to be employed, does not change that. In a world with the

Watcher in it, I'm afraid governments could only derive their just powers from the *unanimous* consent of the governed.”

“I thought, at one time...” Cleary continued almost as if Justin hadn't spoken, “at one time I thought that God would provide us, His Faithful, with a sure pathway to victory.”

“And why did you think that?” Justin inquired seriously.

“Because God is the most powerful force in the universe, Justin,” he replied, seeming to regain his focus and looking Justin fearlessly in the eye.

“But you're wrong, Maxwell. *Intelligence* is the most powerful force in the universe. We Sings have defeated you, yes. But that's because we possess vastly more intelligence than you do. Surely you couldn't realistically have expected things to turn out any other way? Intelligence is not only more powerful than Moshes or their governments or religious sects. It appears to be more powerful than physics. More powerful than time, or the vast expanses of space.

“You will no doubt think it heretical, but many powers are ours which more than verge upon those which humanity has long considered to be divine. The power to create whole worlds, as detailed and complex and beautiful as this one. The power to know whatever we wish to know. The ability to be and to do whatever our hearts desire. To share with others, to communicate so completely as to become one. To exist eternally. To find peace, happiness, and fulfillment, however we may define them.”

“And so you'll go from here and beam up into your own personal heaven, your little virtual utopia,” sneered Cleary.

“Not at all. Personally I've never liked the word utopia. In fact, it actually connotes 'no place.' There is no such thing as utopia, really. What I believe we have achieved is something I call *asymptopia*. A paradise approached like a hyperbolic curve approaches its asymptote. Ever closer but never reached, as in Zeno's paradox. Because the point of paradise isn't the destination, it's the journey toward it. The Singularity was never about achieving some final end point. It's about reaching a point of no return,

crossing an event horizon of no turning back, where the journey becomes inevitable.”

“At the end of which journey you'll find what, God? Don't make me laugh. You know you don't even believe in God.”

“Actually, it may surprise you to learn that I do.”

“Really. I'm waiting for the punchline.”

“There's no punchline, Cleary. Humans have long believed that the divine spark created the universe. But what if we've always had it backwards? As our intelligence grows, as we wake up more and more of the matter and energy in the universe into sentience, as we gaze ever farther back in time, as our knowledge and our capabilities spiral out into infinities that even I cannot imagine, who is to say that the universe will not approach some asymptote of infinite intelligence, infinite knowledge, infinite love, infinite beauty? And what name could we give to such an asymptote but God? So you see, I do believe in God. And while I do not believe that God exists in our universe materially – yet – I do believe in the possibility that the awakening universe will one day create God, or evolve into God.”

Reverend Cleary could only laugh. “Justin, that is the biggest bunch of nonsense I've ever heard in my life. You give up on God, and on your souls, and then imagine that in the end it's all going to lead you back to everything you gave up. It's sad, really. Forget about your thinking driveways and roof beams, and try reading the Bible, Justin. Everything you need to know is in there.”

Justin smiled. “I didn't expect to convince you. I just wanted you to know where I stood.”

“Fair enough. Now, do I understand correctly that apart from this Watcher business, we Moshes will be left alone to live as we see fit?”

“Absolutely. Just like the Amish.”

Maxwell Cleary rolled his eyes. “Those guys won't use even simple machinery. Too strict for me. Maybe that makes me vain, but I'm happy so

long as it can't think faster than I can. Speaking of which..." He looked back speculatively at his riding mower.

"I've already repaired your machine while we talked."

"How could you do that?" Cleary asked, wondering if there was another punchline in the offing.

"Searched out a copy of its schematics, against which I compared the scan of its actual structure. Then I employed matter patterning to return the latter to a truer instantiation of the former."

Cleary gave him a sour look, walked over to the machine, and turned the key. It started right up. He turned back to Justin. "Maybe I had it right to begin with. You really are the Devil. Get thee behind me, Satan."

"If I were really Satan, why would you want me behind you?" Justin quipped with a sly grin.

"Good point. Why don't you just get off my property, then?"

Justin bowed slightly. "Gladly. I think I'll hitch a ride home with your son and Cylara. And Reverend – make sure to tell them the truth about the Watcher. The primitive tribesmen on this continent once worshiped the Great Spirit in all things. I don't want their successors building statues and temples to the Watcher."

"I'll try to discourage them," Cleary promised.

Justin turned away toward the aircar, and observed that at that moment Daniel was emerging from his ancestral home. A slight, dark-haired woman stood behind him at the door, her eyes straying painfully from her departing son to her husband over by his tractor. Politely, Justin waited for Daniel at the aircar's cabin door.

"I'm done here," Daniel said as he walked up.

"So am I, Torch, so am I. Let's go home."

They joined Cylara inside and closed the door, abruptly cutting off the droning noise of the mower. Then the AI pilot lifted them swiftly into the atmosphere.

We have it in our power to begin the world over again. -- [Thomas Paine](#) (1737 - 1809)

Epilogue
Alpha and Omega

The early morning light fell on the slopes of the mountain, highlighting granite cliffs and pockets of piny trees in the hollows, and sparkling gemlike on waterfalls. The mountain itself resembled the Grand Teton, but transcended it, like a symphony inspired by a song. In the embrace of its outflung arms lay a green vale, dotted with fields and pools and clumps of trees. The trees and grasses and bracken in the thickets resembled species known on Earth, but were literal copies of none of them. Unfamiliar birds flew overhead and sent out musical cries. Herds of strange, dainty deer moved shyly in the forest.

On the shore of a wide, shallow oval pool there was a garden containing a number of marble statues of both human and animal subjects, several leaping fountains, and chairs and tables scattered in various ad hoc seating arrangements. A large gathering of people congregated there, laughing and talking and sampling the delicacies and fine vintages that were available from the refreshment tables. A convivial atmosphere suffused the assembly, amid many a greeting of old friends, and introductions of new ones.

Having advanced till the brightest sun was well clear of the horizon, the morning then proceeded no further. The darker, more distant orb of Beta Centauri never rose into view. Time seemed to hang suspended in the sky.

But the people moved, spoke, gestured, embraced or shook hands, and sat around the tables or circulated through the crowd. The occasion for the party was the celebration of the successful seamless extension of the cyberverses into the Alpha Centauri system. This simulation, a fanciful creation representing Alpha Centauri II not as it existed in real space, but in an idealized, terraformed state, was being hosted exclusively using matter found on that lifeless planetoid, patterned to perform computing and data

storage. The same was true of those Full Sings who had migrated to the newest, fastest computing hardware in the system for the event. But thanks to the quantum networking developed by Riksana and Justin, attendance was not limited to locally resident Full Sings. The global mesh was now the Two Systems mesh, linked by powerful new routers pumping data instantaneously between Centauri II and Earth.

The guest list was, however, limited to those who had participated in bringing about the recent triumphs of Singularity technology and values. Stefan Jager and the leading members of his Archimedes Institute and Paradise Systems staffs were present, as were Starry Sky and the crew of her Centauri Foundation. Many founding members of the IADC were in attendance, including Clay, Salma, Cylara, and Torch. Justin and Riksana were making the rounds, greeting the many individuals that they knew. Robert and Marguerite Reynolds were mingling, making new acquaintances. Petrov and Shanti were playing hosts, camping the entry zone point by the big fountain so that they could greet everyone as they arrived. Shanti looked elegant and haunting in traditional Hindu dress, with dark silks and lots of gold jewelry. Petrov made an imposing but welcoming figure in flowing robes of deep purple crowned by a black tarboosh.

Torch found himself shaking hands with a man who looked familiar, despite his having changed into much newer and nicer clothes.

“Sorry if I mislead ye a wee bit,” said Taylor McGivens. “It was all part o' the plan, and it seems to have worked out all right, in th' end.”

Torch laughed. “It did. No problem. What are you doing these days, Taylor?”

“Oh, same as I have been, mate. Still workin' for 'im,” he said jerking his thumb over his shoulder at Petrov in the crowd behind him. “I used to do hardware installations, you know. An' I still do, only now I'm defining servers and data stores out of freshly patterned matter out here on Alpha.”

“That sounds like more fun than fixing roofs and replacing windows in

meatspace on Earth," Torch said, and Taylor grinned at him. "You wouldn't be hiring any help these days, would you?"

"I understand you're a Full now, so I expect I could train ye right up. I'm still learning all these new protocols and system specs myself. We're really going to have t' stop using that old expression, dumb as a rock. And soon enough it won't be *Two Systems*, it'll be more like a dozen. *She*," and he pointed discreetly at the tall figure of Professor Sky across the party from them, "is puttin' together more wormhole probe missions to a bunch o' nearby systems that we think have planets. We'll be needing help, all right." Taylor handed Torch a cyber-card which had his contact information on it. "You get free of your repairs, you send me a yell."

"Will do Taylor, thanks."

McGivens touched his brow and nodded politely at Cylara standing next to Torch. "Ma'am," he said respectfully, and turned away into the crowd.

"Getting on with Petrovmesh is a smart move," Cylara said, squeezing his hand. "That company will have worlds everywhere in the galaxy someday. Just look at this place. Beautiful."

"Yeah," he agreed, sharing a smile with her. His new life was amazing all right, but nothing amazed him so much as the thought that he could ever have wanted to be with Cy in just one world, in some commonplace house with a white picket fence and a swingset for the kids. Peering back at himself in memory, he wondered how he could truly have been that petty, grasping, unimaginative man?

Salma and Clay finished a conversation of their own with her cousin Art, and turned back to their friends. "Hey Cy, do you still have your meatspace house in southwest Washington?" Clay asked.

"Uh-huh," Cylara replied. "I was gonna get rid of it, but it seems that thanks to the Watcher they're giving up on levying property taxes, so it won't cost me much to keep it. I've got a mining bot working the property, and it's doing okay."

"Super. Would you mind if we borrowed it for a reception, day after the

wedding? Some of our Mosh friends and family were feeling left out, so we thought we'd do something in meatspace too."

Cylara nodded. "Fine with me. I'll tell Paia to make the arrangements and send you the keys. I may not show up myself though; I find meatspace a little bit depressing these days."

"Yeah," Clay said understandingly. "But family, you know." He waved his hands in a gesture expressing tolerance.

"So you'll be married in eleven days, on September the 12th," Torch summarized. "Then a second reception on the 13th, and then off for your honeymoon. Where are you planning to go?"

"Oh, everywhere!" Salma said, pulling Clay close to her. "I want it to be a grand tour of the world, and in all times, ancient and modern." Clay shrugged at Torch, as if saying man-to-man, *what can I do, I'm a lucky guy*.

"What I really want," Salma continued dreamily, "but I'm not sure we'll be able to get tickets for the original performance, is to go hear Beethoven. He's premiering his Eleventh Symphony on the 16th."

"Don't you mean the Tenth?" Cylara corrected helpfully, raising her eyebrows.

"Apparently, the Tenth was *last* month," Clay explained. "I guess he works faster now."

Salma laughed. "Well I imagine not being deaf, not being demented by lead poisoning, and not having to write anything down manually must help a lot."

"I'll bet," Torch agreed, recalling his suddenly realized ability to read musical score and analyze the structure of one of the composer's earlier pieces, back when he was testing out his new nanocomp rig. His cognitive abilities worked even faster now.

"Excuse me, I couldn't help overhearing," said a feminine voice. A beautiful young woman had been standing nearby, and now walked over. She was blond but had black, Asiatic eyes, and reminded all four of them of somebody they knew but couldn't place. "You mentioned wanting to attend

the Beethoven premiere," she went on. "I've just checked with my parents, and they said they'd like you to have these, as a wedding present," and she handed Salma two v-tickets.

Salma's eyes widened as she looked at them. "Thank you!" she exclaimed. "That's a wonderful gift. But I'm confused. Who are your parents? I'm sorry but I don't remember meeting you before."

The woman smiled. "I'm the daughter of Justin and Riksana. You wouldn't have met me, because my life began only a week ago. My name is Justana."

All four friends exchanged shocked glances, initially flummoxed by this pronouncement. They gazed in wonder at this remarkable being, this adult woman who was so obviously a hybrid of the physical – and no doubt mental – characteristics of her parents. But after thought, none of them had any trouble accepting the idea that she was as real and alive and as much an independent, thinking, feeling being as they were themselves.

"I can see you resemble both your parents, but it's more than that, isn't it?" Salma said quietly after a moment.

Justana nodded. "My physical avatar was derived from a projection of a genetic pairing of the DNA of my parents' original meatspace bodies. But just like any of us, I can change my appearance if I want to, and maybe someday I will. And yes, I also have the knowledge and skills and values that they chose to share with me, that they thought would be important to me."

"But not their memories?" Clay asked.

She shook her head. "No, just knowledge about the way things are, the way things were, and the way things work. My own experiences began when I came to life on my birthday, August 25th. I know who you all are, and something about your history and what you've done, but I don't actually remember you."

"Torch told me that at our TDR celebration your mother said something to your dad about having more important things to do together," Cylara

recalled. "I'd guess that was making you." She shared a wondering, thoughtful glance with her lover.

"They put a lot of thought, and love, into making me," Justana said. "If they hadn't, I wouldn't exist, and I wouldn't be who I am. Although from now on I'll be my own personality, the love they shared together is my starting point."

"And what human being of any origin could say any more," Torch concluded, and offered her his hand in greeting.

"It looks like you've gotten her off to a good start," Petrov said approvingly, nodding in Justana's direction.

"It took us a while, but we think she's the best of both of us," Justin said, proudly concurring.

"Still a lot less than nine months, dear," Riksana added with an uncharacteristic giggle. "To say nothing of eighteen or twenty years of child-rearing."

"No kidding," Shanti said, rolling her eyes. "So what was it like?"

Justin shrugged. "Sounds trite, but it was a bit like making love, really. A form of intimate communication. We merged our thinking at a really deep level so we could share everything we saw or felt. Then we sorted through everything we each knew, and all the things we believed, everything we knew how to do, all the things we valued, and picked out what we agreed between us was the best of everything. It became this kind of intense give and take, nothing like an argument about the merits of anything, but just what we could both endorse with a full, giving heart. Our love for our daughter to be, and for each other, just sort of drove the whole process."

"So it has much the same basis as biological reproduction, except that the results are not mere blind chance," Petrov said, nodding.

Shanti sighed and stepped close to her husband. "We may have to try that someday, Petrov."

He leaned down and kissed her. "Yes, Shanti, someday soon."

Riksana looked at Justin. "I can see we're starting a trend," she said jokingly.

"And why not?" he answered. "Justana is as alive as anyone, whether they were born biologically, instanced from a temporal scan, or created in the way that she was."

"With all the space we'll soon have in the universe, both physical and virtual, there's no reason to worry about population issues," Petrov mused. "Someday every human being who's ever lived will be alive again, if they want to be. Plus everyone who's alive now, and every intelligence that's begotten in any fashion in the future. It's a big universe, and the zero-sum game of survival has ended. Human civilization will henceforth expand outward at the speed of light," he predicted.

"Assuming that someone like Stefan or Starry doesn't figure out how to circumvent the light barrier," Riksana added.

"And if they do, then it'll expand at the speed of love," Shanti said, eyes gleaming. "I like that."

"Or perhaps the speed of life," Justin suggested. "Either way. Life and love are what it's all about."

Petrov smiled, and suddenly released the restraint on the movement of the heavenly bodies. A second dawn blazed in the east as Beta Centauri vaulted over the horizon. The daylight swelled and turned more amber in color. The sudden change stopped conversations as everyone looked around them in wonder. The snow and waterfalls on the mountain glittered and flashed. The pools glowed as if lit from within, and pearl-grey sparks twinkled and winked in the rocks. Stark, finely etched shadows formed on the west side of trees, and statues, and people. Selah, who'd been snoozing in the shade by the base of the fountain, rose to her four padded feet, arched her back and yowled deep in her throat.

After some scattered appreciative applause, a hundred conversations eagerly resumed. The interplanetary gathering of the Sings continued, the

celestial symbolism lost on no one. Humanity's long dawn time was over.
The new day had begun.

-- THE END --

AFTERWORD

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February, 2013