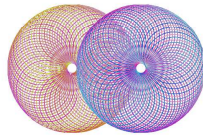


Nano-Plasm

A Novel



Stephen Clarke-Willson

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For Kayler

"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write."

-- H.G. Wells

Nano-Plasm website:

<http://www.nanoplasmbok.com>

My blog: <http://drstephencw.blogspot.com>

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V1.1.3

Jonathan “Joe” Smythe was peering into the stereo lens of his scanning electron microscope. It was the latest model – the EMX-3000. Smythe could requisition any equipment he wanted – and he often did. The other scientists were given his hand-me-downs – and considered themselves lucky to get them.

The three-dimensional view revealed a beehive of activity. Smythe was looking at two colonies of nano-machines which he saw as two distinct areas of activity visible in the microscope. On the left side a set of tiny machines was forming a series of patterns like the patterns that a child's Spirograph toy makes... interlocking spiral shapes that phased in and out in an endless array of patterns.

On the right side Smythe observed another set of these tiny machines, copying the pattern of the first set. Smythe had programmed the second colony of nano-machines to imitate what the first set of nano-machines was doing, except a half-second later. The second colony of nano-machines was fully capable of imitating the first colony within a microsecond – but at that speed Smythe would be unable to make reasonable observations without resorting to ultra-high-speed video recordings. Smythe preferred to do his analysis in real-time with direct observation.

Debugging nano-technology was hard.

He saw nothing wrong with the patterns. The machines appeared to be performing flawlessly. Smythe

made some further adjustments to the stereo microscope. Smythe “flew”, visually at least, in and out, up and down, and in and around the colony of nano-machines. He was searching for a pattern in the three-dimensional structures of the colonies of tiny machines. Smythe felt like he was flying through a cloud of ever-changing organic goo as he adjusted his microscope.

He turned away from the microscope and picked up a Cup O’ Noodles he had warmed up earlier. It was crap to eat but when he was in a hurry to get something into his stomach he often went with the simplest thing. Smythe was patient with nano-machines but impatient about food. Smythe was a little worried about his arteries clogging up from eating too much junk food – but not too worried, because he knew that his employer, the Post Modern Technology Corporation, or PMTC, was working on a nano-technology medical product that would scrub his arteries and veins clean. So long as he didn’t have a heart attack for the next year or two he should be fine.

He went back to watching the patterns in the stereo microscope. With his left hand he adjusted the view. With his right hand he reached over to a small sphere on his workbench positioned next to the microscope. His hand fit comfortably around the sphere, an advanced 3D input device, and as he manipulated it, the patterns created by the first set of nano-machines began to change.

He used the 3D mouse to alter the microwave signals that were controlling the nano-machines, carefully instructing the first set of machines to move closer to the second set of machines, until the two colonies partially

overlapped. The second set of machines continued to mimic the first set of machines flawlessly. So Smythe moved the first set of machines closer to the second set of machines until they were nearly one on top of the other. As the two patterns overlapped, they created beautiful multi-colored moiré patterns. Smythe was enchanted. He zoomed in for a closer view. The patterns were mesmerizing.

He looked away from the stereo microscope and took a sip of the tepid water left in his Cup O' Noodles.

He had expected that something anomalous would have started happening to one of the colonies of machines by now. He returned his eyes to the stereo eyepieces and then made one final adjustment to bring the two sets of nano-machines into direct alignment. A slight humming sound could be heard from the machines. "Aha", Smythe thought to himself. Something unusual *was* finally happening. It was about time. Debugging these tiny machines was incredibly difficult. The problems were never with the individual machines, but with the *system of machines* - the kinds of problems that only showed up when millions of machines were working together. And a million machine system was really hard to debug, so Smythe always made it a priority to create a smaller "reproducible test case" with as few machines as possible.

And finally he had done it. Not only had Smythe reproduced the problem, but he had done it with *style*. The patterns were amazing. Nobody else in the world was working at this level of complexity. Smythe was at the top of his game.

Smythe looked away and took another sip of salty water. In a minute, he would start sending microwave instructions to the nano-machines, which would then start sending back data. Once he had a good data set, he would plot it, find a pattern in the nano-programming, and fix it. For now, he was happy to savor the moment. Nano-tech was so *cool*. Too bad only about twelve people in the whole world knew what the hell he was doing. Still, eight of them worked at PMTC, so, compared to some scientists, he had a pretty good peer group. He'd talk about this test run in gory detail at lunch tomorrow. Everyone always got together for lunch to share stories and experiences. Lunch time was the best time at PMTC.

As he sipped his water, the humming began to increase in volume. This was getting better by the moment. Once he grabbed the data, he was sure a big spike would appear somewhere in the communications/power graph. From there, he would apply some advanced calculus, and voila, he would have everything he needed to figure out a fix.

The humming sound continued to increase in volume. Smythe decided to have another look.

It was beautiful: the two sets of nano-machines were interacting, forming three dimensional structures that he had never seen before. The patterns undulated in and out, rotating through three dimensions. The nano-machines were becoming more active as the humming sound increased in volume. After a minute, the humming sound became irritating, sounding more like a buzzing sound. Smythe squinted so he could focus better.

Smythe started to panic as he realized that the nano-machines were flying up toward his eyes. He pulled away from the microscope.

But it was too late. The machines drilled through the microscope's semiconductors and blasted straight through his eye sockets and into his skull.

He was pushed over backward. He died instantly.

After a few minutes the buzzing sound stopped. The only sound remaining was the water dripping from the Cup O' Noodles that Smythe had spasmodically knocked over in the last microsecond of his life.

– 2 –

Gillian surveyed the rock face above her. It was flat and smooth. Rock climbers normally avoided flat, smooth rocks, because there were unlikely to be good toe-holds. But for Gillian it was a good thing. Progress up the last 100 feet would be speedy. She was using old-school micro-clamps to hold herself against the rock face. If these clamps failed she would plunge a few thousand feet to her death. The micro-clamps created a really tight seal against the rock face. Gillian in turn held onto the micro-clamps. Real rock climbers would call this cheating. Gillian called it progress. Hammering pitons into rock was a lot of work that was best avoided.

Gillian released the micro-clamp held in her right hand and placed it a foot higher. Then she moved her left foot, then her left hand, then her right foot.

The view from this rock face in Nepal was exhilarating. Normally, people at 14,000 feet on the side of a rock face get cold and have serious problems from a lack of oxygen in the thin air. But her form-fitting suit and the filter she used to gather oxygen out of the air made her ascent almost pleasant. Well, not pleasant, exactly, but tolerable, considering she was hauling her body up the side of this mountain. Aside from the exertion, it was fairly pleasant. And she could rest as often as she wanted.

Gillian thought of an old action movie where the hero was hanging on the side of a mountain. In the movie, the hero was a secret agent, hanging on by his bare hands from an overhang. He made a jump without ropes or any safety gear from one rock face to another. Gillian guessed it was some kind of macho thing, where the agent had to prove to himself between missions that he was tough and could take risks. Gillian wasn't about to do that. But then she wasn't exactly a secret agent either. She was a very different kind of agent. Although here she was hanging from a rock face, so it was hard to say what her job description really had to do with anything.

Fifty feet to go. She knew that Bill Stewart was there, busily working away in his cave. It would look better if she surprised him. Gillian thought that work was a little more fun if a person brought some flair to what she was doing. Climbing up the side of this cliff was very cool. What was the fun of just flying in on a helicopter? Plus there was the minor problem that the air was too thin to trust a helicopter up here.

She wondered idly how Stewart had gotten up here – she doubted he had used the same mundane method she was using. He had probably used some of his next-generation nano-tech to cruise up the side of this mountain. That was the kind of thing Stewart would do. Supposedly, the next generation of micro-clamps could just crawl right up the side of the mountain without the climber having to release and re-attach them. They would act like super-strong snails crawling right up the side of the cliff. Gillian had access to some of that prototype nano-technology but preferred products that had completed all their testing. There was no point in taking unnecessary risks.

Twenty-five feet to go.

Gillian was carrying a backpack of supplies. The most important item in her pack was her sat-phone and her portable PC. There was nothing worse than being stranded at 14,000 feet without Internet access. She doubted that Stewart would have an Internet port in his cave, since he had retreated to the cave so he could be left alone, although with Bill Stewart, you never knew.

Gillian had known Stewart for ten years. They had been a couple for five years. He was rock stable, devoted to his work, and didn't fool around too much. And he was a certifiable genius who at 38 was the third richest man in the world. The first and second richest men were oil sheiks. And the sheiks would probably be very poor in the next few years unless they started to invest in some kind of alternate fuel technology. The world would be out of oil soon enough, especially at the rate China and India were growing. An oil shortage was good for the sheik in the

short-term, since the shortage was driving prices up, but not such a good business position in the long term, since everyone in the world was working feverishly on alternate energy sources. When oil was expensive enough, the prospect of a nuke plant in your own city wasn't so scary.

Gillian was two feet from the ledge that held Stewart's cave when she felt a slight chill. She was a little unsure as to how she should go over the edge. She edged up one more foot. Then she detached the micro-clamp in her right hand and removed a small mirror from a pouch on her suit. She used it to peek over the edge. Stewart was nowhere in sight, but there was plenty of gear neatly arranged outside the cave entrance. Well, of course, she'd seen all that from the satellite photos. The question was, was Stewart inside? Well, there was nothing to do but climb over the ledge and look for him.

She hoisted herself over the edge and sat down. She was only slightly out of breath, probably more from excitement than exertion, since she had paced herself pretty well. It was possible that Stewart could see her from the inside of the cave, but she couldn't see inside the cave, as it was quite dark.

Gillian activated her helmet camera.

She walked over to the cave entrance and tip-toed in. The cave had a slight bend to the left. How convenient. That would help trap some warm air, and keep anyone from seeing inside from the satellite. As she rounded the bend, she found something completely unexpected.

Stewart wasn't there.

– 3 –

Bobby “Crash” Pendleton, head of security at the Post Modern Technology Corporation, was staring at a very large pool of blood surrounding what used to be a very senior scientist at PMTC. There were no footprints in the smooth pool of blood or any other signs of forced entry, or struggle, or much of anything.

Well, that kind of thing happened in criminal cases. He was going to have to call in a few favors and get some forensic experts out to PMTC to figure this one out.

But it was going to take more than a forensic expert to figure out how Smythe’s brain and eyes and a portion of his spinal column had been removed from his head intact, and placed two feet away on the floor. The sight of Smythe’s eyes still connected to his brain by a bundle of neurons almost made Pendleton throw up.

Pendleton posted a guard and told him to leave everything alone. This problem was going to require every clue they could find. And, he suspected, most of the clues would be sub-atomic in size.

– 4 –

Bill Stewart, entrepreneur, billionaire, scientist, and at this moment, missing person, was supposed to be in this cave. Gillian and Bill had arranged this meeting a week ago when it became apparent that data was missing from the PMTC computers. She and Bill had planned to rendezvous here in this cave after Bill had some quiet time to figure things out. They hoped that with Bill out of

communication for a week that the crook would become bolder and expose himself.

Bill had also retreated to the cave to work out a few last bugs in the big new product line that his company was getting ready to launch.

But now Bill was missing.

Gillian sank to her knees, suddenly exhausted.

– 5 –

Five hours later an irritating buzzing sound stirred Gillian to wakefulness. She had had strange dreams of subatomic particles flying around her. They made a buzzing sound like flies.

The buzzing sound was actually coming from her ear transducer, which fit against the bone at the back of her ear, and allowed her to hear, via a wireless connection, sounds from her cell phone or laptop. Gillian tapped the transducer twice – once to pick up and once again to immediately hang up. She was in no mood to talk to anyone. Her stomach was empty – physically and emotionally.

Gillian surveyed her surroundings. Stewart had done a nice job outfitting his hideout. There was the laptop – Gillian prayed the data was still on it – a satellite phone, several lights providing bounce light off the ceiling and a chair. A very large box had electrical outlets – probably a giant UPS (uninterruptible power supply). Gillian wondered how he charged it up. Then she saw the solar panels. They hadn't shown up in the satellite photos, so he

must have put them out for short periods of time. They must be really efficient.

Too bad Gillian didn't feel efficient. She rolled over and fell asleep again on the bed.

– 6 –

The buzzing in her ear returned. Gillian touched behind her ear to pick up and said, "Hello."

"Gillian? Where have you been?" the voice asked. It was central dispatch.

"Sleeping." Gillian rubbed her eyes.

"We've been trying to wake you for hours. What's the situation with Dr. Stewart? Are you okay?"

Gillian rolled over and sat up on the edge of the bed. "The situation with Dr. Stewart is he wasn't here and there is no sign of him or any kind of foul play. What else do you want to know?"

There was silence on the other end of the connection. "Just a moment."

The voice returned after two minutes. "I'm sorry. Give us a quick summary and then return to PMTC."

"He left his laptop behind. I hope the data is on it somewhere. I haven't turned it on or off in case he – or someone – booby-trapped it. I'm going to need forensic people up here. We're going to have to go through all this crap one item at a time. I'm not hauling it all down the cliff so you're going to have to send someone up here. I'll take the laptop but you'll have to dispatch someone to hike

up here and get the rest of it. I'll cover the cost. What is the weather forecast for here?"

The dispatcher paused while she consulted another screen. "It looks good for your descent. Transportation will be waiting for you. There's one more thing you need to know.

"There's been a fatality at PMTC: one of the senior scientists. This is going to cast your situation with the missing Dr. Stewart in a whole different light. We need you back at PMTC as soon as possible.

"Dispatch out."

Most days, Gillian liked feeling needed and useful. Today wasn't one of those days. Suddenly her life was very complicated. She prepared to make her descent. As she was packing up the laptop, she saw a digital camera on the table. She grabbed that too – after all, it held data, so maybe it had some clues about Stewart's whereabouts.

– 7 –

The PMTC boardroom was nicely outfitted with dozens of video screens on the walls, an embedded teleconferencing setup with monitors buried into the table in front of each chair, and a plate of fruit in the middle of the table. The fruit had not been touched. Several of the board members had glasses of water or orange juice in front of them, while others had Diet Coke or Sprite.

An agent of the Universal Fidelity Corporation (UFC), Harold Witherby, was briefing the assembled members of the board about Stewart's status, or rather,

acute lack thereof. Gillian had arranged for Harold to brief the board and keep them up to speed until she arrived. Gillian had a stable of agents that she could call on to help out when necessary. Of course, she had to pay them herself. Harold was a solid guy and Gillian knew his presentation would be very matter-of-fact, which was something the board needed right now.

Not all of the board members were physically present. Some were teleconferenced into the meeting. Each board member physically present was using the large flat-panel monitor built into the table in front of him or her, displaying images of the teleconferenced members of the board.

Mark Pfizer, one of the board members, spoke up. “How do we know the product series will ever work? Maybe there are reasons – mathematical reasons – why the systems become unstable. Maybe nano-machines that small simply can’t work. Maybe Dr. Stewart figured that out while he was hiding in that cave and bailed out on all of us.” Pfizer was a decent guy but a little conservative. Harold could never figure out why guys like Pfizer would invest in something as complicated as nano-technology and then get all wussy about it. If you couldn’t stand the heat, stay out of the kitchen.

“I’m not a mathematician but the fact is that Dr. Stewart and his staff have demonstrated remarkable results. The math is based on Quantum Mechanics – as far as I know math doesn’t get any more detailed than that. We’ve believed the basic theory to be sound from the start, but executing something at this level of detail requires

painstaking care. That said, there *were* some bugs that still hadn't been fixed, and Dr. Smythe was working on one of them. Between Smythe's death, Stewart's MIA status and the loss of the bug database, we could be looking at a six to eighteen month delay in the product rollout. And now UFC is going to demand much more rigorous testing than we had originally planned, and that will take more time as well.

"We're doing our best to track down what's happening here. Gillian's one of our best agents and she's flying out to Anegada to meet you."

Pfizer spoke up again. "Where are we in our thinking about Stewart? Foul play or in hiding? I keep thinking that in his heart he knew there was a problem that couldn't be overcome and this entire enterprise is doomed."

Harold tried to keep from rolling his eyes. Instead, he said, "Again, I'm not a scientist, so I can't answer that question, but obviously Stewart believed it was possible to build this kind of technology, and he was very close to finishing. We've been over and over his psych profile, and the fact is, he is one of the most stable individuals we've ever dealt with. We think it is far more likely he was the victim of some kind of foul play... maybe he was drugged or otherwise influenced and that's why there wasn't any sign of foul play in the cave."

Pfizer wouldn't let up, "How long until you decide it's hopeless and pay off the policy and we all move onto something else?"

Harold replied, "Ultimately these kinds of situations are a negotiation, but historically our company pays first and asks questions later. Honestly, if, as a board, you all

want to cash in your insurance and leave the company to UFC you can do that right now. What you all will have to ask yourself is ... would you rather have the cash or the company? Because if we pay out, we get the collateral and you lose your company. And in the long run, the company might be worth far more than the payout. That's something you all need to discuss. At any rate, I'm sure we at UFC can count on your complete cooperation as we investigate this."

With that, Harold left the room.

John Cummings, the vice chairman of the board, addressed the board. "I think we need to give them at least a month or two to explore this thing before we call it quits. And even then, we might propose a partial settlement, because regardless of this specific product rollout, there is a ton of technology here that has marketable value, and we shouldn't just hand it over to UFC. Maybe there's some kind of intermediate position where we trade some shares to UFC and they cover the cash-flow and future business losses. Or maybe we can cover our losses and even make some money by selling off the technology piecemeal."

Cummings stroked his beard, which was turning white. Cummings had his own doubts about Pfizer and no doubts whatsoever about Stewart. If only there was some way to get investment money out of these kinds of bozos without actually having to pretend they were involved with the company. Cummings had been working with Stewart in one form or another for almost twenty years. And it was always the same story – to jump really far ahead on the technology curve required a lot of money, which meant

kowtowing to guys like Pfizer. Cummings kept his feelings to himself. After all, it was a big part of his job to keep the investors happy, and that was going to be a bit tough without Stewart's calming influence around.

Pfizer said, "A month is no problem, but the cash flow required to keep this place open is significant, and if there isn't going to be any return, we might as well throw in the towel, either completely or partially as you suggest. I hope those people at UFC show some results soon. I'm all for taking a risk as long as it is a managed risk, but right now, PMTC has just undergone a severe leadership change. And I don't like that one bit."

John Cummings said, "If we're agreed we can continue for the next month at least while we explore all the possibilities, then we can adjourn and make a more definitive decision later."

After a little more discussion, the meeting broke up.

— 8 —

Gillian was taking a well-deserved shower when a tone sounded and a voice announced, "We will be landing in about fifteen minutes. Please finish and return to your seat."

Gillian sighed and turned off the water. She stepped out into the small room that held the shower and toweled off. There was a small window looking out on the Atlantic Ocean. She was in a helicopter skimming above the ocean waves on her way to PMTC on the island of Anegada in the British Virgin Islands. Anegada was – in fact, still is – a

bird sanctuary. But it was also, now, a great experiment in capitalism, sometimes called “Hong Kong II”. The British economy was so depressed the Parliament had decided to convert their bird sanctuary into a free trade zone, in the grand hope a second Hong Kong would emerge. And this one wouldn’t be leased to a bunch of communists. This one would remain under the control of the British. The deal was simple – set up shop on Anegada and the British government promised a flat tax rate of 5% for at least one hundred years. There were no deductions and no exceptions. The tax paid for the lease on the land and nothing else. No police force, no military, no sewers. It was up to the settlers to build their own infrastructure. UFC, from various contacts in Parliament, had some insider knowledge of what was planned, and so it had quickly purchased 85% of the leases through various front corporations. It was a potential bonanza if it was managed well. UFC was very careful about subleasing. That made UFC the virtual owner of Anegada.

So far, only seven subleases had been signed. The biggest was with PMTC. And these leases, just like UFC insurance policies, came with strings attached. UFC was a strict landlord. For instance, the amount each sub-lessee could disturb the environment was strictly limited, with cash penalties attached for screwing up the environment. As a result, most of the corporations that leased space had the majority of their facilities underground.

Gillian finished dressing. She had her corporate war gear on – dark gray slacks and matching sweater over a conservative white blouse with long sleeves. As they

approached, she could see a broad expanse of empty beaches, marred only by the outline of several buildings under construction. She knew it was going to be a resort. Most of the buildings were just awaiting a final coat of paint. The resort was due to open in only a couple of months. She suspected it would be the kind of resort that started at four figures a night. If you had to ask how much it cost you probably couldn't afford it.

She strapped herself into her seat for the landing and went over the report on Smythe one more time. The helicopter settled on a concrete landing pad about a hundred yards from the ocean that blended in with the surrounding sand. As she emerged from the helicopter, her senses were assaulted by a combination of salty ocean air and hot sun. It was quite a change from the freezing cold of Nepal.

Lila Styles, Dr. Stewart's executive assistant, came out to meet Gillian on the landing pad. Lila led Gillian across the landing pad toward the edge. There was nothing but sand and ocean as far as she could see – and a pair of handrails sloped down into the sand. As she and Lila approached, some of the sand slid back revealing a passageway down into the earth. They both went down the passageway and approached a door.

Lila looked briefly into an iris-scanner, held her hand onto a touch plate, and said her name aloud. The door opened into PMTC. A cool breeze of conditioned air greeted them. They were in a small air-lock. As soon as the door closed behind them another opened in front of them.

Lila turned and gave Gillian a hug. They had both suffered a tremendous personal loss. “This sucks,” Lila said, “but it’s good to see you back here.”

Gillian smiled weakly. This was not the time to cry.

“Thanks Lila. Let’s get inside.”

Lila and Gillian had already been scanned for weapons while they were in the air-lock, and the computer that ran many of PMTC’s security systems knew two people had passed through the door. Lila was highly trusted, so Gillian was able to get past the first security checkpoint, but Gillian knew, because UFC had installed most of the security systems, she wouldn’t get much farther without further identification and verification. She had been away too long – her identity would need to be reconfirmed.

Lila’s voice had been checked for electronic artifacts that might indicate it was a recording, and checked for stress artifacts, indicating someone might be forcing her to allow access. And several cameras had beamed her image and that of Gillian’s to the central security area, where the entire complex was under video review. There wasn’t much privacy at PMTC. Even the wash areas of the bathrooms were under surveillance.

There was no receptionist in the anteroom. Since Gillian had been away from the complex for more than two weeks, she had to re-register her palm-print, voice-print, and iris-print; these would be compared to her previous id-prints, and verified and adjusted for any change in her physical self that climbing 14,000 feet in Nepal might have made.

Finally, she stood in front of a small facial mirror. She lined her nose and eyes up with three dots marked on the mirror. Her facial features were being downloaded into the security system, so she could be tracked by facial identification if necessary. Finally a new id card popped out and she clipped it to her blouse. She would now be allowed access to the medium security areas of PMTC.

Her first task was to visit the security office, and get her access increased. Even though she was a trusted agent of UFC and well-known to PMTC staff members, it still took a human interview to verify *this* Gillian was the *same* Gillian they trusted. A door opened and Lila and Gillian headed off for the security office.

Lila knew all about Stewart and Gillian – more than most people knew. While their relationship wasn't really secret, a certain amount of discretion in their behavior meant that most people at PMTC didn't know they were involved. But Stewart confided in Lila about everything. Without Lila, Bill Stewart couldn't find his way to his next meeting, so Lila had to know about Gillian, in order to make sure Gillian showed up in his schedule. Lila had been close to Stewart in a different way than Gillian, but she had known the man very well, and getting over this change wasn't going to be easy.

Gillian asked, "How are you holding up?"

Lila blinked and considered. "As long as I'm busy it isn't too bad. I just imagine he's away on a trip. It's when times get slow that the pain hits."

Gillian said, "I know." She slumped slightly then held herself back up. "He wasn't supposed to disappear. It

would almost be easier if there had been signs of a struggle. Not knowing anything is really hard.”

“You know, people are going to start to think ...”

“I know. Don’t let it get to you. I’ll get this whole thing cleared up, and make sure Bill retains his good name.”

– 9 –

Gillian followed Lila through the smooth white corridors. The walls were cement that had been smoothed by nano-machines, which made the walls so smooth they seemed to glisten. The corridor walls were interrupted by doors and various displays of awards that PMTC had won over the years. A thin red line was etched into the wall. The PMTC facility was arranged in a spoke-and-hub configuration, with seven hallways branching out from a central meeting area and cafeteria. Each main hallway had a different color etched into the wall. The red line led to the exit. Eventually Gillian would follow the yellow line to the test labs – to see the one in which poor Smythe had met his end.

Gillian had asked that the crime scene be kept intact, but, due to the decomposition of certain biological materials, namely the body, the brain, and various fluids, that wasn’t practical. So instead hundreds of 3D photographs had been shot of the scene and then the biological materials had been removed. Gillian was going to have to study those 3D pictures.

Smythe's demise had also been recorded for posterity on three different video cameras. PMTC was covered in cameras and Smythe's lab was no exception. An external processing lab had been working to correlate points from the 3 cameras so a 3D re-creation of the accident could be made using computer aided design (CAD) software. Gillian was a little anxious about seeing the video and the 3D re-creation. She was anxious for two reasons. The first reason was because she wanted to find out more information and was therefore very curious. The second reason she was anxious was she was pretty certain it was going to be very disturbing and her stomach was a little tense at the idea of it.

Lila and Gillian entered security. Security was located at the inner most part of the red-line corridor. That way anyone entering or exiting the more secure areas had to pass through security. All other exits were alarmed emergency exits.

"Crash" Pendleton was waiting for them. Gillian and Pendleton had only met a few times before and then only informally. Pendleton was dressed like an executive in a well-tailored suit. Gillian spotted the ear-transducer behind his ear. If he put on sun glasses he would look like a Secret Service agent.

Pendleton said, "I'll expedite this for you. I've already got your tracking badge ready. Just hold it like this for a moment."

He held it with his thumb on one side and the rest of his hand on the other side. He handed the badge over to Gillian, who held onto it. A copy of her thumbprint was

promptly embedded into the badge. The badge would be destroyed when she left or when two weeks went by, whichever came first. The badges were constantly recycled with different encryption algorithms at least every two weeks.

“Now hold it up to your eye.” Of course, Gillian already knew the routine, but she let Pendleton guide her through it anyway. A new retinal scan was taken and embedded in the badge.

“Okay, let’s go.”

Gillian said, “Goodbye Lila – I’ll catch up with you later.”

Lila left the room and headed down the green, administrative corridor. Gillian and Pendleton talked while they walked in the central cafeteria and then exited into the yellow corridor.

Pendleton began. “The mood around here is pretty dour. Smythe’s accident was a big shock.” He paused. “We’ve never had an accident here before. Shit, we’ve never had an accident like this in the history of the company. I’ve been in charge of security for fifteen years. It’s been a dream job.” He paused. “I’ve gotten all the support I’ve ever needed, our security is terrific, we have tons of surveillance, the latest equipment, and of course UFC analyzing the hell out of our workplace. There isn’t a safer place in the world. At least, that’s what I thought. And then Stewart...” His voice trailed off.

Gillian wondered what UFC would be like if Melissa Hathaway, the owner of UFC, passed away. She turned away from the thought.

They walked in silence for a few minutes. Gillian decided to switch to small talk. “How did you get started here?”

Pendleton looked relieved at the change of subject. “I was in the Marines in Internal Affairs, which is where I got my experience in security. The Marines paid for my schooling. I have a Master’s degree in Nano-tech. Everybody here has *at least* a Master’s degree in Nano or a closely related field. The lowest-level workers are all Masters degree or Ph.D. interns – this is where they get their real education. They are damn lucky to apprentice here. When I finished my time in the military I started working with Stewart. That was in the first year or so that PMTC was formed. It started in his garage but that only lasted about two months – from there it grew pretty fast. Stewart got me interested in designing nano-tech machines for security. Low-level sensors and pattern-matchers – stuff like that. Before I knew it, I was managing a small R&D staff. Then this whole Anegada project opened up and he asked me to supervise security throughout the construction and operation of the facility. That was a few years ago.”

Somehow the subject of Stewart had returned to the conversation.

There was another awkward silence.

Pendleton changed the subject this time. “How did you get started in insurance?”

Gillian laughed. “I was recruited into it. Insurance has such a boring image. I never thought I’d be an insurance agent. I’m pretty good at it though. I’ve saved

the company a lot of money in twelve of the fourteen claims I've handled since I became an autonomous agent."

"What's an autonomous agent?"

"That means nobody really supervises me. I choose when and where I work – results are the only thing that matter. I'm autonomous."

"Sounds like the good life."

"It can be. Of course, if I don't get results I don't get paid. And I pay my own expenses. Anyway, you mentioned that Stewart supported you in your work."

Gillian realized she had inadvertently mentioned Stewart again. Gillian continued, "Well, at UFC, I get a lot of support too. At most companies they say shit rolls downhill. At UFC it seems to somehow manage to run uphill. It's such a strange thing, because with so many autonomous agents, you'd think it would be chaos, but somehow it all gets coordinated. I love my job. 'Beats working', as they say."

Pendleton asked her, "Sounds like a lot of work to me. How much support do you think you'll get on this one?"

Gillian considered. "There are different kinds of support we can get, depending on the type of case we are on, but the kind I usually need is the cash kind. On this case, I'll have a budget of 5% of the expected loss that could occur if we didn't do anything. Anything I don't spend – and that the company doesn't pay out – I get to keep as compensation."

Pendleton stared into space for a bit. Then his eyes widened. "But that's ..."

Gillian finished the sentence for him. “A considerable sum of money. Well, let’s hope so. That means the problem is easy to solve.”

Pendleton looked at Gillian with new respect in his eyes.

– 10 –

They came upon Smythe’s lab. The microscope with the shattered eyepiece was fairly conspicuous. The usual chalk outline was on the floor. It outlined a body ... but there was another outline where Smythe’s brain and eyes had been found. The autopsy said it was all intact, but the doctor doubted it had been functioning after it was somehow removed. For one thing, it was missing a blood supply. For another thing, nobody really thought that Smythe survived the first intrusion into his head. Finally, there was also the minor problem that it was physically impossible to remove someone’s brain without opening his head. Smythe’s skull was completely intact.

Gillian removed a small telescope from her purse. Her purse wasn’t your typical woman’s purse. It was mostly electronics. She peered through the telescope at the crime scene, looking for clues. It was pretty rare for a UFC agent to find something the forensics people hadn’t found, but she agreed with General George S. Patton: “One look is worth a thousand reports.” She always took a look at as much of the physical evidence as possible. Sometimes it was gruesome but necessary work.

But the photographs would be far worse. She asked Pendleton for the computer file. He held up a smart card and she held it next to her purse. The data was transferred in a few seconds. She decided she would look at them later in the privacy of her room.

The whole thing was surreal. Had Stewart known this was going to happen? Is that why he went missing?

“I’ve seen enough for now. I need to go through these reports with a fine-tooth comb. I assume my quarters are in the blue hall. I’ll find my own way.”

She gave Pendleton a smile. “Thanks for bringing me here. I’ll be in touch with you later.”

Pendleton said, “Sure,” and watched her walk back to the hub. He wondered just how smart this insurance lady really was. She’d have to be pretty bloody smart to figure this one out.

– 11 –

Gillian waved her card near her door. She didn’t need to insert the card into a slot. The Bluetooth radio-frequency communications built into her badge only needed to be nearby in order to open the door. Of course, if her card was stolen, it was unlikely the door would open for anyone else, because the PMTC computers were always tracking and correlating her location and everyone else’s, and if something was amiss, the door simply wouldn’t open.

Her accommodations were outstanding. She had a beautiful view of the ocean shore which was pretty cool

since she was about thirty feet underground. The view even had some parallax to it. The view out the window shifted with her motion as she walked around the room. There must have been some kind of holographic component to it to get the 3D effect. Sound and a small amount of salt air were piped into her room.

Gillian sat down and closed her eyes to meditate for a few minutes. Once her mind was quiet she felt prepared for the next step.

It was time to look at the videos of Smythe's death.

Gillian set her purse on a desk near the bed. The contact between the purse and the desk was enough to connect the computer in her purse to a large flat display built into the desk. Gillian used her fingers to touch pictures of buttons on the display and to activate the playback of the first video camera. Then she switched to the second and the third.

In each case, the pictures showed the same results. One moment Smythe was adjusting his microscope, and the next moment his head jerked back from the eyepiece and he fell to the ground. Something – presumably nano-machines – came flying out of the stereo eyepiece. Unfortunately, it wasn't clear what happened after that, because the view in the video didn't include the floor. The particles streamed out, looped around, and headed toward the floor. And that was it. Clearly something had gone seriously wrong with the nano-machines. But how had Smythe's brain been removed?

It must have been the nano-machines ... but why didn't they just grind his brain into mush? Sherlock

Holmes used to say that when all possibilities have been examined and found wanting, the last reasonable explanation, no matter how unlikely, was the correct one. Gillian was going to have to exhaust a lot of possibilities before she believed that the nano-machines had somehow figured out how to surgically remove Smythe's brain.

Gillian hoped the 3D reconstruction would provide some more answers, although with very little data available to build the reconstruction it was unlikely to provide a big breakthrough.

Gillian ran the video back and forth several times looking for clues.

Then she took a nap.

– 12 –

Gillian had made a habit of taking power naps after she read about how B-2 "Spirit" Stealth Bomber pilots managed to fly for over 24 hours with just two pilots in the cockpit. She had found that for herself at least, a twenty minute nap or two taken judiciously during the day made the day go a lot better.

She frequently had a short dream during her power-nap. It was a good thing – she thought of it as her brain working out new connections between the facts she knew. This time wasn't any different. In her dream, the nano-machines kept flying around and around in tighter and tighter circles until they got so close they exploded. There was a buzzing sound and she woke up.

It was the buzzer for her room. She quickly brushed her hair back and opened the door. It was Pendleton.

“Hello Crash.”

“Hello Insurance Lady. It occurred to me you might want to see our working prototypes.”

Gillian suspected that Crash had made up an excuse to come see her.

“Sure, that would be terrific. Can you get one of the scientists to show me?”

“I can do it. I told you everyone here has an advanced degree in nano-tech. Everyone here keeps up on the latest developments. We have lots of working prototypes. The vast majority of the bugs in the prototypes are cosmetic – even the buzzing sound Smythe was working on was cosmetic. Or so we thought. Come along and I’ll take you to the product showroom.”

Oh well, Gillian thought. Crash wasn’t such bad company.

– 13 –

They walked through the blue hall toward the center hub.

“The product testing rooms are off the purple hall.¹ Do you want to grab some coffee on our way? We’ll go right past the cafeteria.”

¹ Red hall – entrance/exit. Blue hall – living quarters. Yellow hall – research labs. Green hall – accounting/admin. Purple hall – product test. Security is located at the center hub near the cafeteria.

Gillian smiled. “No thanks. Caffeine is evil. I wouldn’t mind some sparkling water though.”

They entered the cafeteria. It was 3:00 in the afternoon and only sparsely populated with various scientists and research staff taking breaks. All of the food was free. Gillian grabbed a bottle of sparkling water from a refrigerator while Crash poured himself some coffee.

“I don’t know how I would get through the day sometimes without caffeine. How do you live without it?”

“Very well, thank you. It’s pretty well documented that caffeine disrupts your sleep cycle, sometimes in subtle ways, and reduces your efficiency and depletes your internal resources. I *have* had it sometimes, but I know I’m going to pay for it later. Instead I take power-naps, which genuinely refresh me. You should try it.”

Crash felt rebuffed. “Ah, come on. Coffee isn’t that bad, is it? I live with it all the time. I feel bad when I don’t have it.”

“That’s called withdrawal. I’d tell you to get off it as soon as possible, but it’s going to hurt like hell, so that’s something you’ll have to decide for yourself. The funny thing about coffee and caffeine is that it’s not that bad for you until some external stress multiplies the effects. My job is pretty stressful. Luckily for you, it sounds like things have been going pretty well up until now, so the caffeine probably isn’t screwing with your system too badly.”

Crash tried to defend himself. “I don’t need that much sleep. It sounds like you need a lot of sleep. I just don’t need it.”

Gillian gave him a break. “Well, that’s great, because we’re going to need all of our resources to figure this thing out. Let’s go see those product prototypes.”

Crash refilled his coffee cup.

They left the cafeteria by way of the purple hall.

As they walked Crash explained a little bit about the PMTC product strategy.

“Stewart likes to do everything with flair. There’s an infinite amount of potential to use nano-tech for medical treatments by sending in colonies of machines to effect low-level repairs on the body, for example, to scrub out plaque in the bloodstream. The trouble is, as you can imagine, releasing a product that goes into a person’s bloodstream is something that is pretty hard to get past a government agency like the Food and Drug Administration.

“We are developing those kinds of products, of course, but Stewart knew it would be a long time to get those out, because of all the testing, so he decided to make some mass-market products to fund the company in the meantime.”

They entered Product Prototype Room A. “We usually start our demonstrations in here with the simple stuff. Have a seat.”

The room was arranged like a typical living room, with a couple of chairs and a couch and a TV set. Gillian sat down in a comfy chair and waited for Pendleton to continue. The chair was *very* comfortable. She leaned back into it some more. Her back muscles relaxed and her shoulders dropped a little. She hadn’t known her muscles were even tense, but after feeling them relax, she realized

she must have been carrying some tension around with her. She also felt more alert.

“You’re sitting in one of our most outstanding consumer products. That’s a nano-tech chair. It’s conforming to your body and massaging your muscles at a microscopic level, which relaxes you and improves your blood circulation. You might even feel more alert. Usually when people sit down in a regular chair, they feel less alert, because bending the body constricts certain muscles and therefore the blood vessels. But not this chair. You actually feel better sitting down. We want to extend this technology to beds and improve everyone’s sleep. You’d like it.”

Gillian got out of the chair. It *was* very comfortable, but the idea of a zillion tiny machines poking at her was unnerving.

Gillian looked closer at the chair.

Pendleton continued, “The kinds of changes you felt aren’t visible to the human eye. The most you might see is a kind of subtle change in the reflective quality of the leather. Of course, it’s not actually leather. Touch it again, though, and you’ll see it feels *exactly* like leather.”

Gillian touched the chair. It felt like excellent quality suede. She eased back into the chair. The effect was subtle but noticeable. The back of her thighs even relaxed.

Gillian thought the chair was pretty cool but had to express her concern. “This is terrific, I think, but it’s kind of creepy. How were you going to sell this to people without creeping them out?”

Pendleton frowned. “Stewart was going to sell it to wealthy people first, people with disposable income and who aren’t afraid of new technology. You can charge a huge mark-up and, if they like it – and in this case they will – they will tell their rich friends how cool it is, and the market will grow almost automatically. Some rich people will even write it off as a business expense, because it makes them more alert.

“The capper was going to be that Stewart was not only going to guarantee the product, but also provide a guarantee against any secondary or consequential damages – the strongest product guarantee ever. And of course y’all at UFC were going to provide the insurance for that ... which meant massive testing. The testing has been fantastically rigorous.

“The problem is, of course, we’ve had this accident. So there’s no way your company will issue us that final insurance policy unless UFC is 100% confident the problem that caused Smythe’s accident is completely understood and fixed.”

“Well, don’t jump ahead of things. We don’t know that Smythe’s death was an accident. I guess we should move on. But I don’t want to get out of this chair!”

Crash said, “You can imagine that if people believe in this product and it catches on that we could make shirts, pants, heck, even bras and panties and stockings out of this stuff, and it will help keep you alert all day.

“People would need less caffeine. You’d like it.” Crash grinned at Gillian.

Gillian tried to imagine a power-nap in this chair. “Do you think you could roll one of these into my room? I’d like to try a power-nap in it.”

Crash smiled. “Sure. No problem. I’ll see to it myself.”

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Pendleton continued his product demonstrations. He pointed to a multi-colored lava lamp.

“I mentioned Stewart likes to do things with flair. We’ve made some completely useless products for entertainment value only. Who knows – someday they might be considered art. We’re hoping they become cash cows for us. We’re making each one extra-special by making a numbered series for each product and getting each one signed by the artist. This silly thing is just an updated lava lamp, but we plan to make a ton of money from it.”

Pendleton waved Gillian over to look at the lava lamp. Gillian relinquished her spot in the comfy chair. As she approached the “lava lamp” she noticed that it wasn’t in a glass container. In fact, it wasn’t contained by anything. Little bits of multi-colored matter floated in space, moving up and down and rotating, all at different rates. It was fairly mesmerizing.

“Check this out.” Pendleton waved his hand near the “lamp” and the patterns responded to his motions. Next he waved his hand right through the floating material. The

particles were blown around the room but slowly found their way back to the “lamp.”

“It automatically scales its motion depending on what’s going on in the room. It senses air temperature, motion, and lighting and then adjusts the patterns. At night it emits more light and projects patterns onto the walls. In a stagnant environment it goes into ‘sleep’ mode, and then when someone enters the room, it ‘wakes up’, creating a multi-colored display. I can get one of these in your room too, if you want. It makes a great night-light.”

Gillian was intrigued. “Sure, why not?” She hoped things didn’t get too psychedelic around here. She liked to stay grounded. Still, that chair *was* pretty nice.

Pendleton continued. “Check out this mirror.”

Pendleton walked over to a mirror mounted on a wall at eye-level. He placed his hand in front of the mirror, which looked like a normal mirror, and it started to extrude toward his hand, until it reflected not just an image, but a 3D dimensional view of his hand.

Pendleton put his face close to the mirror. The mirror extruded until it looked like an exact mask of Pendleton’s face.

“We’re not too sure what good this is, but it intrigues a person, which is all we’re after. It uses manufacturing and replicating techniques we use in industrial products. Try it.”

Gillian was again apprehensive and approached the mirror slowly. As she got closer, she could see the mirror approach her face as it extruded toward her. It was a bit creepy.

“You guys really have to work on the creep factor,” she said. “What happens if you touch it or it touches you?”

“Try it.”

“You try it. I’ll watch.”

Crash put his hand up the mirror and then pressed against it. The mirror retreated back to its normal flat state. “Some people like creepy. It’s not that big a deal for our target market – rich guys without enough toys and with cash burning a hole in their pockets. That mirror is going to sell for \$10,000.00, and will only cost us about \$100.00 to make. All that extra cash will help us pay down our R&D costs. It’s our way of redistributing income to people who need the money – namely, from rich people with discretionary income to us and our investors.”

It made sense. Starting in the ‘50s through the late ‘80’s, most of the improvements in microcomputer technology had been funded by the US government through the Department of Defense. But in the ‘90s and ‘00s, a strange thing had happened. Semiconductor research became funded primarily by *entertainment* companies who wanted to put cooler and cooler effects into movies and then later into interactive game boxes. It was ironic, because most of the show business people Gillian had met were afraid of technology. Luckily, there were always a few who pushed the edge of entertainment technology, like Lucas, Cameron, and that new Russian director, Snovoski. Cameron would probably buy every one of these gadgets that PMTC put out for sale.

So, Stewart had noticed a pattern and was going to use entertainment to fund his company. Or maybe it had

been Melissa Hathaway's idea. Mrs. Hathaway, the founder of UFC and Gillian's ultimate boss, was always looking at things differently. Capitalism was so strange. Who would have thought that show business would drive technology forward?

Crash said, "Time to see some of the future of manufacturing."

They left room A and walked down the hall to room E.

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Room E was considerably more industrial looking.

"This is where we are experimenting with using nano-tech for manufacturing. This is a bit harder than making a comfy chair, because the coordination amongst the nano-machines is much more important and much more complicated. In the chair, the nano-machines feel the weight of your body, and then coordinate with other nearby nano-machines, which is relatively easy to do. The machines don't need to do any complex planning – they just react."

Crash walked over to where some machinery was set up. He took off his watch and placed it under a scanner. He stepped back and pressed a big red button.

"This is pretty safe, but not as safe as our consumer products, so it's good to be a little more careful. Watch the machine and also keep your eye on this monitor."

A red light scanned the watch. Then a stream of particles emerged from the scanner and headed toward the

watch. It reminded Gillian of what had happened to Smythe. The particles flowed down around the watch and encased it in a mass of particles. On the monitor, a 3D representation of the watch was being created. Then the particle stream retreated back into the scanner.

The machine beeped twice and Pendleton picked up his watch. Pendleton used a mouse connected to the monitor to spin the 3D representation.

“As you saw, the particles had to actually plan a path into and around the watch. As they swarmed over the watch, they sent data over a microwave link to this computer. This is an accurate 3D CAD view of the outside of my watch. More importantly, it’s an accurate 3D CAD view of the *inside* of my watch too.”

Pendleton used some buttons and the mouse to zoom the view.

“The data I just grabbed includes the material characteristics – this isn’t just the shape of the watch. This is a complete database that would allow us to reproduce my watch.”

Pendleton stepped sideways to the machine on the other side of the monitor. He pushed another red button and stepped back.

A stream of particles emerged and formed a blob at the base of the machine. A short time later they retreated. A watch just like Pendleton’s was left behind.

“Unfortunately, this new watch won’t work, because we’re not at a point where we can convert one kind of metal into another. So this is just a replica, made from molded silicon. In fact, many of the nano-machines you

saw positioned themselves in the right place and then melted themselves to form this shape. Other technology we're working on involves nano-machines that get the right material from bins of materials and then move that material into the right place. Working with other machines they can construct more complex shapes. We've managed to duplicate relatively simple things with lots of repetition in them. Don't tell Intel – we can make perfect copies of their latest chips.”

Gillian was surprised. “I thought computer chips were amongst the most complex products mankind has ever devised.”

Pendleton smiled. “Programming them is complex, but they are made of simple, repeating building blocks of transistors, resistors and capacitors, and they are very easy to copy.” Pendleton chuckled. “At least for us. Anyway, Intel can still make them far cheaper than we can.”

Gillian was curious. “Are you going to patent this stuff?”

“Well, as a matter of fact, no. Patents have a lot of problems. All it takes is one guy with some cash in Taiwan or God-knows-where to read the patent and then start making stuff to destroy our market. It's up to the patent-holder to enforce a patent and that can be very expensive. And the rules are different in each country. So we just keep it all a secret. Our machines will self-destruct if anyone tries to reverse engineer them.

“And when we sell a machine it becomes the property of the person who buys it. We don't track or charge royalties for products made with our products.

That's an accounting nightmare. It's all cash up front – you buy the machine and then do what you want with it. And in the case of our manufacturing equipment it's all “buyer beware.” We stake our reputation on the quality of our products, but we're not going to be liable for every crazy thing someone might do with our products. Of course, we have to adhere to the laws of whatever country we're selling our products in, so there is always some liability, which your lovely insurance company covers.”

Gillian pressed on. “This is the kind of technology that can be severely abused. What are you going to do about that?”

Pendleton smiled again. “We program in lots of safeguards. We don't want our own technology turned against us, and we don't like it used to create instruments of war. If someone could use this technology against an ‘enemy’, then who is to say that same someone won't decide one day we are the ‘enemy’? So we're pretty proactive about protecting ourselves, and that protection naturally extends to others. It's all part of keeping our reputation intact, because if we get a bad reputation, national governments will come down on us like a ton of bricks. So we have to make sure equipment like this isn't abused. Still, there's a fine line – sometimes destruction is a very creative act such as when someone demolishes a building. No doubt nano-technology could be used to take an entire building apart.”

Gillian said, “That stream of particles looked just like what happened to Smythe. And you just reproduced a

watch. Maybe the particles he was looking at misfired somehow and made a copy of his brain.”

“Of course we thought of that. But the colony of machines he was working on was completely different. Every machine has a special purpose. And that wasn’t a copy of his brain – that *was* his brain. There was nothing left in his skull. The logical conclusion is the nano-machines moved his brain out of skull molecule by molecule and then reassembled it. The only trouble with that hypothesis is that it is completely impossible, even using our most advanced prototype machines.”

Gillian persisted, “It may be impossible, but it matches exactly what happened on the portions of the tape we can see. We can’t see what happened on the floor but it is logical to assume it happened just like this prototype process you showed me.”

Pendleton was not persuaded. “It’s logical except that it is impossible.”

“Could someone have switched the kind of machines that Smythe was looking at?”

“Switched them for what? I told you, we don’t have anything that could possibly move a person’s brain out of his skull. Ask anyone here. It’s impossible.”

“Maybe the machines that Smythe was looking at were modified somehow. What happened to them? Where are they? Has anyone examined them? That could be the key to the whole thing.”

Pendleton looked annoyed but then his annoyance changed to embarrassment. “We don’t have the machines. There was no sign of them. One theory is that they

embedded themselves in Smythe's brain tissue. Another is that they lost their coherence and just got absorbed into the air system and vanished. I can call the coroner and arrange an examination of Smythe's brain. I don't hold out much hope that we'll find out anything useful. I think you're barking up the wrong tree, Insurance Lady."

"No problem. I do that a lot. Sometimes it pays off. Maybe this will be my lucky day. We need to find what happened to those machines."

Gillian changed the subject. "Your whole business plan depends on secrecy. For instance, as an agent of UFC I knew a bit about this product roll out, but I didn't know any of the details of the products you just showed me. Who was in on the details?"

"You need to talk to Dr. Langsford. He is the head of R&D. Well, Bill Stewart was really the head of R&D, but Langsford managed it all day to day. I'll set up an appointment with him."

– 16 –

Gillian and Pendleton walked back to the cafeteria.

"Time for more coffee," Pendleton said.

"If you drink enough coffee you'll become psychotic, you know," Gillian said with a smile. "I'll just have water."

They each retrieved a beverage and sat down at an empty table. Other PMTC staff members came and went while they talked. Everyone was on "flex time" and could take a break whenever they wanted.

"You know, Insurance Lady, if this product rollout blows up it will have bigger ramifications than just this company. This whole BVI initiative will get tainted."

Gillian knew what he was talking about. The whole business of a Hong Kong II was based on free enterprise with little regulation. If it didn't work out for any reason, the Labor Party in Britain would use it as justification for more regulation. In fact, governments all over the world were watching the BVI Enterprise Zone Experiment. The thinking from the point of view of the companies participating was it was a great opportunity to work in an unregulated environment. From the point of view of the British government, if the companies located in the BVI Enterprise Zone were successful, it was a potential tax bonanza. Five percent right off the top of all the activity in Hong Kong was a small government-sized fortune.

If the product rollout blew up and there was a death involved besides, the government regulators of the world would have a field day. And the odds that more Enterprise Zones would be created would drop dramatically.

"Our company is committed to making sure private regulation such as our company provides is more effective than your typical government regulation. Without regulation, things spin out of control; we just think we can do a better job than a bunch of bureaucrats. We've done some clever things over the years. I'm confident we'll figure this out. UFC has a bunch of very clever people associated with it. Our philosophy is that good systems produce good results and bad systems turn even good people bad."

Gillian paused, and then asked, "Crash, when was the last time you heard anything about Greenpeace?"

Crash reflected a bit. "You mean the people that would get in the way of fishing boats and chain themselves to trees and what-not? I guess I haven't heard about them for several years. What's that got to do with anything?"

Gillian replied, "You haven't heard of them for several years because Greenpeace doesn't exist anymore. Universal Fidelity co-opted them and turned them all into capitalists!"

Crash looked surprised. "That's one of the strangest things I've ever heard. What did you do, bribe them?"

"No, we just hired the smart ones, and gave them a better option. We were starting to issue a lot of environmental policies. We would guarantee a certain business wouldn't violate any environmental laws and we would promise to pay all the fines if they did, and in some cases promise to clean it up as well. A business would buy a policy from us because it was easier for them to get permits from local and state governments if they had insurance. It's the same deal as your home mortgage - if you want a loan from the bank, you have to have insurance on your home. If you want to work in an environmentally sensitive industry, you either have to self-insure, which only a few big companies can afford, or find insurance.

"Well, we don't issue insurance policies without taking steps to ensure we rarely pay off on them. We needed some people on board who were good at lobbying and who really understood the environment and environmental issues so we could determine how much to

charge for a policy, you know, what the risks and potential liabilities were. And we wanted people who were good at lobbying, because even a die-hard environmentalist will admit that some laws backfire. We wanted to use their lobbying skills to get rid of the really stupid laws, especially the laws that are self-contradictory with other laws. Those are a big problem for us, because sometimes the laws conflict with each other and it is impossible to *not* break the law. We couldn't have that.

"Greenpeace was a great source of staff members for us. There was this great pool of talent. Many members were lawyers and were great at lobbying and great at understanding the real issues. And they made dirt working for Greenpeace, so they were easy to hire."

Pendleton looked dubious. "Didn't they feel like they were selling out?"

"That was a problem. But we made a pretty good case that working through us would be better than chaining yourself to a tree. We hooked a couple of key people who were willing to try it. They had a good time - they helped change the world a little bit and made more money besides.

"For instance, the first people we hired were some of the big-time tree people. These were people who wanted to save every tree on the planet no matter what. We started issuing policies for environmental insurance for logging companies. We need additional expertise to help us craft those policies. There were plenty of tree-hugger types in Greenpeace to choose from. We recruited this guy Tim Houseman along with his wife Kim. They were well-known to all the interested parties.

"If you think it was hard to convince the Greenpeace people they weren't selling out ... imagine how hard it was to explain to the logging company chairman we had just hired a husband and wife team he considered to be two of the most obnoxious people in the world! That was our biggest problem – convincing our clients we could get these tree-hugging people to work in the client's best interest.

"It took a lot of mediation to find the middle ground that made sense for the logging company, the environment, the former Greenpeace-niks, and local, state and federal governments. But once we had everything hammered out, and backed by the financial resources of UFC, we had a model we could use moving forward. Tim and Kim were so pleased with the impact they had on all the parties that they became two of our strongest supporters when it came time to recruit more people from Greenpeace and other environmental groups."

Pendleton digested what Gillian had said for a few moments. "You guys really think outside the box, don't you?"

"We just redefine the box. People love to be in boxes. We make better boxes. Profitable boxes, where business is win-win for everyone. Getting people to a new place of agreement is hard.

"Most of time we find the more contentious the two sides are, the more they have in common they don't know about. We have a whole group of folks dedicated to mediation. And our mediation people have something your typical political mediator doesn't have access to - we have

sophisticated statistical models that allow us to make really good guesses about the likelihood of certain outcomes. Most laws and even corporate policies are built on "what would happen if" whereas our 'requirements', if you will, are built on "what is likely to happen if" and then we use an insurance pool to handle the unlikely cases. It's very modern."

Pendleton reflected some more on what Gillian had said. "You guys ... and gals ... you're like a shadow government. Holy shit. And you get away with this?"

Gillian smiled. "We don't 'get away' with anything. We provide government-like services people willingly pay for. And the services we sell are better than what you get for 'free' - that is, via your taxes - because we spend a huge amount of effort analyzing the way things *are* rather than the way people *wish* things were. "

Pendleton was getting more disturbed. "Isn't that a lot of power for your company to hold?"

"Sometimes," Gillian said, "but we know as well as Bill Clinton should have known that eventually it all comes out in the press. That keeps us responsible. And so far, because our agents make enough money and save even more for our clients, we haven't had a rogue agent go crazy and start cheating everyone by cooking the numbers. That's probably the biggest threat to our company - a single rogue agent that could ruin everyone's reputation. But we have checks and balances to prevent a single crazy person from ruining everything. Someone is probably discreetly checking up on me all the time."

"You guys at UFC have thought of everything."

"Not everything - we've just thought really hard about a lot of important things. Someday, which could be any day as far as we know, we'll get some serious competition, when some smart person figures out what we've been doing and maybe even takes it a step further. Then the economics of things will change. But guess what - we're already building statistical models in anticipation of just such an eventuality."

"Well. This is really something. I'd better be on my toes around y'all."

Gillian smiled. "I don't think you have much to worry about, Crash. We'll figure this thing out. We always do. One place we like to start is with a list of the other smart people we are up against, so we can size up the population. If it was an employee of PMTC that somehow reprogrammed the nano-machines, it would have to be a smart one. Let's make sure Langsford gives us a good list of the smartest people here. We'll check that against our own psych-profiles which will narrow the list further."

Pendleton smiled back. "Sure, that's no problem at all. But I have to tell you that I doubt there is anyone here that is smarter than Stewart, and the person you're looking for would have to be pretty smart to have altered the programming in those nano-machines. But what the hell, there isn't much else to go on, is there? Might as well start working our way through each and every employee. That might turn up something."

Gillian had no enthusiasm for going through a lot of employee records. She would delegate that task by hiring a subordinate to do it.

“Well, I guess it’s time I met Dr. Langsford.”

– 17 –

It was a great thing about modern computers – once you convinced them to trust you, they went whole hog and let you see everything.

The man who was browsing the PMTC employee files and surveillance cameras was completely trusted by the PMTC computer system. He had heard that there was another backup computer system that was supposed to be more difficult to penetrate but so far he hadn’t seen any evidence of such a machine. The idea was the backup system had been installed by a different vendor and worked differently than the main system. He believed this illusory backup system was a convenient fiction manufactured to scare off people who might want to penetrate the main computer system. It was supposed to make hackers like him wary. It didn’t appear to have succeeded in that regard.

The man knew exactly how smart everyone at PMTC was – in fact, he knew more than was present in the employee database. It was a convenient fact that the main computer system provided access to psych-profiles for every single member of the company from Stewart on down. Fortunately, from the man’s point-of-view, one of the entries was wrong. One of the people in the employee database was a darn sight smarter than his employee records indicated.

Breaking into the PMTC computer hadn't been very difficult. The man wished he had access to a similar set of files about the UFC agents. It would be good to know how smart the people at UFC really were.

The man reviewed, via a surveillance camera recording, the recent conversation where Gillian was bragging about how clever UFC was. It sounded like these UFC people were all about analyzing the hell out of everything. How many statistical models did they have going? Was there one that calculated the odds that a key employee would secretly covet everything the founder had created?

It was vital for the man that PMTC be ruined – all credibility must be lost. Once the technology fell out of favor for a few years, he could pick it up and start over with his own, up-to-date copy of the product database, including all bug fixes.

But he hadn't planned on these UFC people being quite so clever. It seemed more important than ever that the whole operation be discredited. And the best way to ensure that was with another fatality. And the man was watching a surveillance tape of the best candidate for a quick and, if she was lucky, painless death: Gillian.

Like the last fatality, this one would take a bit of planning. Gillian had provided him with a great idea. If he arranged the evidence to indicate that Gillian had been a rogue agent – maybe even in cahoots with her boyfriend Stewart! – then he could kill two birds with one stone. He would discredit PMTC and hang the blame on Gillian and then kill her so she couldn't be interrogated. Very nice.

Arranging the evidence for that would be a little harder than the actual death. But it would only take a few planted files here and there for Gillian's UFC associates to find and that would be that. Spying on people and stealing their ideas was so much easier than working hard to invent one's own ideas. And the idea of the rogue agent was perfect. Too bad he wouldn't get any more ideas from Gillian once she was dead. He sighed to himself. That was the price of progress.

– 18 –

Gillian settled into her room. Pendleton's continuous attention was starting to affect her. She didn't want him to take advantage of her unstable emotional state. She didn't want *herself* to cave into her messy feelings. Missing Stewart *hurt*. It would be easy to let Pendleton be a salve.

She needed some space to think things through on her own. She also wanted some time to poke around without Pendleton escorting her.

She settled down at her desk and started surfing the Internet. Sometimes when Gillian wasn't sure what to do next, she would just start mindlessly surfing the Web. She never knew where she would end up. She never knew what bizarre bit of information she might come across that might be useful someday.

Gillian's homepage was a mix of links to news sites, search engines, and web cams with views from around the world. She started by clearing her intellectual palette by visiting web cams from Paris, London, Rio de Janeiro, the

Artic Circle, Washington D.C., Moscow and finally a view from the International Space Station. They were beautiful pictures ...

Pictures ... what had happened to the analysis of the camera she had brought back from Stewart's lair in Nepal?

Gillian pulled up her email and fired off a question to Dr. Philip Rosenberg, senior agent responsible for forensics within UFC.

From: Gillian@ufc.net
To: pr@ufc.net
Subject: Stewart's Camera

Phil,

Please update me on the analysis of Stewart's camera and any other data items found at his site in Nepal.

-- Gillian

It was an old trick to embed secret information in pictures. The science of such trickery is called Steganography. Stewart would be smart enough to bury his data in his camera images – if he wanted to. He'd also be smart enough to know that eventually we would figure it out. Gillian sighed. She'd have to wait for the report from Phil.

Gillian went back to surfing. She checked out the weekend box office figures and added a couple of films to her video wish list. Gillian had seen about three movies in a theatre in her life. She saw the vast majority of films

while traveling. Her purse could store dozens of full-length movies, for which she would pay just a few dollars each to watch. Her purse didn't contain a display, but she could either use projection-goggles or a nearby flat-panel to watch a movie. Once she had watched a film, it was automatically removed from her flash drive and the next film in her wish list was downloaded.

Managing her movie wish list got Gillian thinking once again about Steganography... Steganography was hiding information in other items. What would a nano-tech engineer do to hide information? He'd build it into a system of nano-machines that had some other purpose. There was no sign of any nano-tech in Stewart's lair. They still didn't know how he'd managed to get up to the cave with his gear.

Ugh. Gillian groaned inwardly to herself. It was too complicated. Nothing made much sense. Smythe was presumably killed by errant nano-machines that had disappeared. The PMTC nano-technology worked perfectly except for some cosmetic bugs ... and the fact it had – perhaps – killed a person. Ugh.

Gillian's priority email beeped.

From: pr@ufc.net
To: Gillian@ufc.net
Subject: Re: Stewart's Camera

Gillian,

Have been unable to find any information hidden in any of Stewart's gear. There were a couple of strange

photos (attached) but no sign of hidden information. Will contact you if I find anything.

-- Phil

Gillian opened the attachments and looked at the two photos. The first was a picture of a TV set with a picture of a TV set in it, *ad infinitum*. Gillian had seen pictures like the first one before – if you took a video camera and pointed it at a monitor that was showing what the camera saw, you would get “video feedback”, which looked like a ghostly tail reaching out forever. It was what happened when the camera saw what it was seeing. It was similar to the horrible high-pitched howling a microphone that was too “hot” would make. So Stewart was interested in feedback. She’d have to do some surfing in a moment and learn about feedback.

The second was a picture of a child’s Spirograph toy. Smythe’s nano-machines had been programmed to make Spirograph-like patterns to help him debug them. Maybe that had been Stewart’s idea? Or was Stewart exploring the same line of reasoning as Smythe, but without the experimental data? How much was Stewart communicating with Smythe?

Gillian felt like she had made some progress. Now, at least, she had a lot of questions and could spend some time looking for answers.

Gillian returned to her Web browser and started surfing again.

Four hours later Gillian felt she knew a lot more about feedback and Spirographs and a lot less about what the hell was going on. Feedback was simply when an electronic circuit got stuck in a loop. Positive feedback, which sounded like a good thing, was actually a bad thing. It meant, for instance, if a person had a sensor connected to their lawn sprinkler, and the sensor was supposed to control the amount of water on their lawn, and the sensor got stuck giving the sprinkler positive feedback, then the sprinkler would dump as much water as it could on the lawn and never stop. That was bad. A proper circuit needed negative feedback as well.

And Spirographs were just a clever mechanical way of combining sine waves and circles to make cool patterns.

What did one have to do with the other?

Maybe nothing, Gillian thought. After all, these pictures were just two random photographs that Phil had forwarded to her.

And yet they were important enough for Stewart to have in Nepal.

Gillian decided it was time for a power-nap. She sat in the nanotech comfy chair that Pendleton had delivered to her room. She felt her body relax. In fifteen seconds she was asleep.

Her dreams were filled with particles flying in circles, making Spirographic-like patterns, merging, splitting apart, and flying about her room. Suddenly the particles flew straight at Gillian's eyes and she woke with a start.

Gillian got up out of the chair and went to the mirror to comb her hair. She smiled faintly at herself in the mirror. Men didn't have to comb their hair after a nap. Well some did. She bet Pendleton did. She leaned into the mirror for a closer view. As she did, the image started to warp a little. Gillian blinked her eyes to clear her vision. Her reflection looked worse. Gillian leaned in a little further.

Gillian realized the mirror was extruding, similar to the one Pendleton had shown her before. Pendleton must have put one in her room. The mirrored surface jumped out at her and attached to her face. She couldn't breathe. Suddenly she was inside the mirror. Particles were flying everywhere in front of her eyes. She felt herself suffocating. She tried to pull back but it felt like her skin was ripping off. She tried to scream but no sound emerged. She reached up with her hands to try to pull herself away and felt the mirror attach to her hands. Her skin felt like it was on fire. She felt herself disappearing into a void.

Gillian awoke from her nightmare, breathing heavily, covered in sweat, and scared shitless. She was still in the comfy chair. The mirror was perfectly normal.

Gillian calmed herself by taking deep breaths. "Fuck, that was real," she thought. Normally she was all in favor of her subconscious communicating with her ... but not like that!

"Fuck," she thought. She bit the inside of her cheek to make sure she was really awake. She stepped over to the mirror ... slowly. She reached out with her hand. Nothing

happened. She lifted the mirror off the wall. It was a normal mirror.

Gillian startled as her room bell rang. “Fuck,” she thought once again. She was losing it.

“Just a moment,” she called out. She wiped the sweat away, touched up her make-up, and then went to the door.

It was Pendleton.

“We’ve found something,” he said.

– 20 –

“We found something in Stewart’s PC”, Pendleton said. “It took a long time to find because in fact it wasn’t encrypted; the cryptographic guys had been all over every file, searching for patterns. They finally got around to looking at the unused, extra space in each file; Stewart had stored an equation in one of those files about how a positive feedback situation could run out of control.”

Gillian blinked. “So Stewart *was* thinking about feedback. Our UFC forensics people found a picture on Stewart’s laptop in Nepal of video feedback. Let me quickly email our forensics guy and tell him to search for more possible hidden data in those pictures or elsewhere on the laptop or in Stewart’s digital camera. Rosenberg told me he had already done a Steganography scan, but he probably didn’t think to look for additional data in the unused parts of the files.”

Gillian went over to the desk and fired off an email to Phil Rosenberg, the forensics expert:

From: Gillian@pr.net
To: pr@ufc.net
Subject: Re: Stewart's Camera

Phil,
PMTC Security has found feedback equations in the unused file space on Stewart's PC. Please check for a similar trick in the files on Stewart's camera or laptop.

-- Gillian

Pendleton talked to Gillian while she typed. "I've asked one of Smythe's apprentices to set up a little experiment for us in one of the product rooms. We've done a test that shows what happens when two feedback systems start to interact. We can reproduce the buzzing sound now. It's not much, but it's a start."

Gillian finished typing and then replied, "That's terrific actually. A reproducible test case for the buzzing sound was what Smythe was working on. I hope you guys have been careful – we don't want another fatality from all this."

Pendleton replied, "We've been careful. But it isn't that big a deal – it just makes a small buzzing sound. Still, as you've said before, you never know where something like this might lead."

Pendleton and Gillian left her room and headed to the central hub. They turned down the purple hall to the product demonstration rooms.

Pendleton stopped off in Room A and picked up the fancy extruding mirror. First he slipped his hand between

the wall and the mirror and turned it off – there was no point in having it extrude all over the place while they walked. Then he lifted it off the wall and they proceeded together down to Room E, which contained the more industrial nano-tech equipment.

They entered the room. There was no one else there.

“Langsford was supposed to meet us here. Well, like I said, it’s not really that big of a deal. I can demo it pretty easily.”

Gillian frowned. She wasn’t familiar enough with nano-tech to feel very comfortable with this kind of fooling around. Still, Pendleton had been around nano-tech for years and he seemed comfortable enough. She watched him approach the duplicating machine.

Pendleton turned on the scanning machine and the replicating machine and then pushed them a little closer together. “This is perfectly safe, but, as always, keep a few steps back just in case,” he said. Then he turned on the two machines.

He stepped back a bit, and then turned on the mirror. He waved his hand in front of the mirror and verified it was mimicking his movements. Then he slowly approached the duplicating machine.

“Check this out. The interactions here are more complicated because there are two interacting systems. I’m going to bring the mirror close to the scanning machine – but notice the mirror itself will be trying to make a shape like the scanning machine. We don’t normally put a nano-tech machine into one of these copiers. Normally it would just be a static shape. Putting the mirror in is going to drive

the circuitry a bit bonkers and you'll hear the buzzing sound as the two machines interact. The construction machine, which takes the data from the scanning machine, is also going to get confused, because the mirror will be moving around as the scanning machine scans it and the two interact."

Pendleton slowly approached the scanning machine. He pointed the mirror at the scanning machine and the mirror extruded to make a shape somewhat like the shape of the scanner. Then he slid it into the scanner, mirror side up, and the mirror extruded upward. A swarm of nano-machines came out of the scanner and started to move across the mirror. This in turn caused the mirror to start to undulate as it responded to the motion of the other nano-machines. A slight buzzing sound could be heard.

Pendleton continued, "The replicating machine gets really confused now. Normally we store the scan and then turn on the replicator, but to save some time, I'll just let the two things run in parallel. This should be pretty funny looking."

So far Gillian didn't see anything funny about it at all, but engineers had strange ideas about what constituted "funny."

Pendleton pressed a red button on the replicator. A swarm of nano-machines came in from the sides and tried to make a shape like the mirror – but the mirror was undulating – vibrating really – and the nano-machines didn't really have any solid data to lock onto and replicate. So the nano-machines in the replicator started vibrating too. And the buzzing sound increased.

“Check this out. The machines really hate this.” Pendleton stuck his hand in the scanning machine between the mirror and some of the electronics. The mirror tried to make a shape like his hand but with all of the other nano-machines swarming over it the result was fairly distorted.

“Anyway, that’s the demonstration. As you can see, we now have a reproducible test case for the buzzing sound, so some of our better engineers can start analyzing this and fooling with some formulas and system analysis on how the machines interact. This doesn’t really explain what happened to Smythe, though, because he didn’t have two kinds of machines interacting. He just had one kind of machine. I think someone reprogrammed them somehow, even though, as I said, the whole thing is impossible, except it happened. Because as you can see this is fairly benign.”

Pendleton reached into the scanner to take out the mirror. As he picked up the mirror, the swarm of nano-machines started to move from the mirror and to cover his arm.

“Hey, I’m being scanned,” he said.

With his free hand he reached up to turn off the scanner. He flipped the switch and most of the nano-machines stopped moving. But the ones on his hand kept crawling around.

“Hmm,” he said.

He used his free hand again to turn off the replicating machine. The particles continued to swarm on his arm, even though the machine had been turned off.

“Weird”, he said.

Suddenly Pendleton frowned. “Ouch”, he said. He dropped the mirror, which clattered to the floor.

Pendleton screamed. “Fuck this!” He was staring at his arm. There was an increase in the buzzing sound.

Gillian had no idea what to do. The machines were doing something to Pendleton’s arm and whatever it was it wasn’t good. Gillian looked around the lab. She saw an emergency button and ran over and hit it. An alarm sounded and a light in the hallway started flashing.

“Pendleton... what should I do?”

But Pendleton wasn’t listening. He had dropped to the floor and his face was contorted in agony. Gillian bit her lip to make sure she wasn’t dreaming again. She wasn’t.

As she watched, the nano-machines started to leave Pendleton’s arm. Gillian looked in horror to see that the entire top level of skin on Pendleton’s arm had been stripped away. The nano-machines swarmed onto the floor and then seemed to melt into the ground. There was only one thing left behind: a copy of Pendleton’s skin, reconstructed as if a taxidermist had somehow surgically removed it.

Gillian doubled over and threw up.

Two engineers ran into the room and saw Pendleton. One spoke into a phone and ordered emergency medical care.

Pendleton continued to scream.

All three of them stared. They had no idea what to do.

It seemed like hours but just a few minutes later a paramedic entered the room and shot some morphine into Pendleton.

“What the fuck...” the paramedic said as he looked around. But then he composed himself, and said, “I’ll treat this like a burn.” He placed a cast-like wrapping on Pendleton’s arm to immobilize it. He placed a mitten-like wrapping on Pendleton’s hand. The morphine affected Pendleton quickly and he stopped screaming.

Pendleton looked at Gillian. “This is not my idea of positive feedback,” he whispered, and then passed out.

– 21 –

It was an hour later. Pendleton was in the small one-bed infirmary at PMTC. A doctor and nurse who specialized in burns had helicoptered in and rushed through security. They were treating Pendleton’s arm with salves and wraps. Pendleton was conscious but a bit slap-happy from the morphine.

Gillian entered the room, looking fairly pale.

“Hello, Crash.”

“Hello, Insurance Lady.”

“What’s the prognosis?”

“It’s pretty bad. It’s kind of like a burn, but worse, because when a person is burned, they actually don’t have any feeling until the tissue starts to grow back, at which time it turns into a living hell. In my case, the living hell has already started. Luckily these fine people”, and here he indicated the doctor and nurse, “have been keeping my arm full of local analgesics.”

Gillian blanched whiter still.

“I’m more or less looking at six months of living hell. So I’m going to try out an experimental treatment we’ve been working on here at PMTC. Basically, some nano-machines are going to provide me with a new layer of skin. And it’s a very special layer of skin too. It’s going to apply topical pain killers. Kind of like an intravenous drip on a cellular level. That’ll kill the pain and itching. I’ll be up and around in a jiffy.”

Gillian frowned again. How these people could have such faith in their technology continued to amaze her. Gillian was all in favor of high-tech... but this was ridiculous.

“How can you trust nano-machines on your arm after what just happened to you?” she asked.

“Well, when you’re looking at several months of severe agony, the decision making process is pretty simple. I’m in favor of a little risk if it means avoiding living hell.”

Gillian just stared back at Pendleton.

“One thing that is important is the nano-machines disappeared after they finished with my arm. That means they were wired to self-destruct. They just turned into dust, thus destroying any chance for us to find out how the programming was changed. I guarantee you every nano-machine that gets anywhere near me will have had its programming checked ahead of time.

“You asked what happened to the nano-machines that attacked Smythe. I think we know now. They self-destructed. I don’t know if it will help, but I’ll have our forensics people gather every spec of dust in both rooms –

the room where I was attacked and in Smythe's lab – on the off chance there is a working nano-machine that did not self-destruct and whose programming we can analyze. So this painful experience wasn't for naught. Come back in a few hours and you'll see. I'll be up and around, as good as new."

Gillian doubted that, but at PMTC, it seemed, anything was possible.

"Okay, Crash, take care of yourself. I'll be back in a couple of hours to check on you." A wry smile crossed Gillian's face. "You know, you're lucky. Those machines might have attacked your crotch."

This time Pendleton blanched.

A little of the color had returned to Gillian's cheeks. But as she turned to leave she felt a chill run down her spine. Nothing, it seemed, was necessarily as it appeared. Who knew when the mad machines would attack again?

Of course, there was one man who knew. And he knew the next attack would be a little more final in its outcome.

– 22 –

Gillian returned to her room to do some more research. She needed to go over the list of the best engineers at PMTC and try to narrow down who might be capable of doing such horrible things.

What a nightmare.

According to the psych profiles, nobody was even remotely smart enough to reprogram a complete system of nano-machines. Nano-machines are not really made to be reprogrammed. They have programming, but it was very specific and tied into the way the nano-machine hardware was created.

Unless ...

These machines weren't the regular machines. After all, who could tell? They were the size of pieces of dust. And after they self-destructed, it would be impossible to know exactly what the machines had been.

Maybe someone had invented a whole new kind of nano-machine... one that was very general, and could be reprogrammed. Programmed to kill.

Who was just as smart as Stewart, or smarter, and could invent nano-tech that went even beyond what Stewart had invented? And where was he, anyway?

It was time for another power nap. Gillian looked over at the comfy chair and decided that this time she would take her nap in bed as usual.

– 23 –

This time, she dreamed about nano-tech skin. In her dream, she held her hands in front of her face and watched the skin move, like a colony of ants crawling all over her hands. Suddenly her hands turned to dust and the dust fell to the ground.

Gillian woke up and bit her lip to make sure she had really awakened. She didn't need another dream-within-a-

dream surprise. She was indeed awake. And she was starting to think that power naps weren't as cool as they used to be.

Gillian decided to sit in the comfy chair and enjoy the relaxing benefits. The chair felt good and she relaxed into it for ten minutes. When she arose she felt refreshed and ready to go, and her dream had faded a bit.

Nano-tech skin, she thought. What next?

Gillian went over to the desk and surfed over to the UFC private intranet. She had to tunnel into the secure network via the public Internet. She flipped through the PMTC financial data that was stored at UFC. Boring. She surfed through the UFC news archive for articles on the future of nano-tech. Stewart was prominently mentioned in many of them. Also boring.

What did Pendleton say? That UFC was good at thinking outside the box? She didn't even know if there was a box to think outside of in this case.

If nano-tech machines were programmed to kill or go crazy, then someone would have to program them. And the program would have to be stored somewhere ... but the program could be stored anywhere. It could be on a PDA or a Laptop in someone's office. She would never find it.

If the nano-machines were actually different from anything PMTC normally made, they would have be manufactured somewhere. She emailed Rosenberg and asked him to comb through all of the manufacturing logs within PMTC and look for any irregularities or usages of the manufacturing equipment that couldn't be reconciled with other records. It was another long shot. There were

too many long shots in this case. “Leave no stone unturned,” she thought to herself.

Well, hopefully the PMTC scientists would be working on a safe way to explore the positive feedback problem. Hopefully. But she was starting to doubt they would find anything that went beyond a simple buzzing sound. She was starting to suspect what she was really up against was not just a malfunction... She suspected she was up against a whole new level of technology.

Technology that destroyed itself after it was used.

Deadly technology.

Technology that was loose in the PMTC labs.

– 24 –

Gillian decided to go visit Pendleton again and see what was up with his arm and this nano-tech skin business. After all, she’d dreamed about it, so maybe there was something significant there she hadn’t quite put her finger on yet.

Gillian returned to the infirmary.

“Hey, Crash. How’s the arm?”

Pendleton smiled ... and then he waved the arm with his new nano-skin. “Good as new. Better, in some ways, since I’m getting microscopically controlled doses of pain killer all over my skin. You can’t beat that with a stick.”

“How long do you have to stay in here?”

“Just a couple more hours while the doctors monitor my nano-cast to ensure everything is working a-okay. I’ll need to check in with the Doc a few times a day too, to make sure everything stays intact.”

“Well, the good news is you’re insured! So you won’t have to pay for a penny of this. Since it was a work-related accident, PMTC picks up your deductible and we’ll handle the rest. And if you need to take some time off, your income will be covered too. PMTC has a really good disability policy. Since there have been virtually no accidents until, uh, recently, it was pretty cheap too.

“Still, the real purpose of a good property protection company, which is what a good insurance company is, is to prevent this kind of stuff from happening in the first place.”

Gillian looked thoughtful. “And now there have been three accidents. Well, two accidents and a missing person. That’s way too many bad events.”

Crash reassured her. “Don’t worry, Insurance Lady. You know, sometimes the breaks just don’t go your way.”

Gillian looked at his arm. “You’re sure that doesn’t hurt.”

Pendleton replied, “The idea of it is ten times worse than the actuality of it. Although without this nano-tech cast, I would be in a world of hurt. And unable to work, I might add.”

Gillian looked thoughtful. “Maybe somebody wanted you off the job. Maybe your accident was supposed to be even worse than it was. You’d better be careful.”

Pendleton responded in kind. “You need to be careful too. You are as likely a target as me. Maybe we should just shut everything down until this is figured out.”

There was a knock on the door and a man entered. It was Robert Langsford, the head of R&D and the number

two scientist after Bill Stewart. Dr. Langsford was about medium height, with silver-gray hair, and a gray goatee. He looked rather distinguished. He was wearing a white lab coat, complete with pen protector in the lab coat pocket, and a tiny slide rule poking out. Gillian wondered if he actually used the slide rule or if just carried it around as a comfort object.

Gillian tried to be cordial but she knew Langsford was likely to be the primary suspect, based on how intelligent he was. She watched closely to see how Crash and Langsford would interact. Did Crash trust Langsford?

He seemed to. Gillian had trouble following the details of the conversation, but the two men launched right into some serious techno-babble about the nano-cast, and how the system interacted with Crash's body to maintain a new layer of skin and administer micro-doses of anesthetic to the raw skin. It made Gillian shiver with a chill at the thought of the nano-machines doing things to Crash's raw nerves and muscle.

The conversation seemed to be focusing on how the nano-machines would slowly back off as Crash's skin regenerated.

"Men and their toys," Gillian thought to herself. That made her smile: she had her fair share of toys. But nothing compared to these techno-geeks.

The easy relationship between the two men was unnerving. Her main suspect was simply too nice a person. He didn't appear to have any subversive tendencies at all – or if he did, he hid them very well.

“So, what do you think of all this?” Langsford was talking to Gillian. Gillian was taken out of her reverie.

“All what? The cast? It’s amazing technology, but it seems premature to have a human test.”

“Ah, no, I know all about the cast. I meant the accidents we’ve been having. What do you think of it all?”

Gillian paused. What should she tell this man?

“Our biggest problem seems to be the reprogramming of the nano-machines. They self-destruct after they undertake this destructive behavior.”

“What destructive behavior? It appears to me to be incredibly creative. The machines are trying to duplicate human tissue! It’s extraordinary!”

Gillian paused again. Perhaps she wasn’t communicating properly with the chief techno-geek.

“When a man dies, and another has a layer of epidermis removed from his arm, in the insurance business at least, we call that destructive. *Trying* to be creative doesn’t count. It is in fact *destructive*. The extraordinary thing is no one knows what is going on. Unless you do. Do you understand all this, Dr. Langsford?”

Langsford looked down. He wasn’t used to being rebuked. “I don’t understand how anyone could have reprogrammed the machines. I have some ideas about how a positive feedback loop could cause them to go a little haywire, although my hypothesis is incomplete. I would really need one of those nano-machine to examine. I don’t believe with our current technology, positive feedback would cause anything more than that annoying hum we hear sometimes. Damn, I wish I could talk to Smythe. He

was on the verge of figuring it all out.” He paused. “The truth is, I miss him. And Stewart too. It’s just too much.”

Suddenly, Langsford appeared to be on the verge of tears. The man had probably never experienced anything bad in his entire life. He’d probably lived a happy, secluded life in R&D labs and rarely gotten out. Most of his information about the real world probably came from watching movies and downloads. And now his highly structured world had become unstructured.

Gillian would order more psych research on Langsford. But she doubted this gentle man could hurt a fly.

“Dr. Langsford, I’m sorry for your losses, truly I am, but we need you to focus on figuring out how your nano-machines could be reprogrammed. From the sound of things, you don’t even think the machines you make here are capable of being reprogrammed to the degree necessary to attack a person. Please focus on the manufacturing chain ... try to find out where these machines could be coming from, either from within PMTC or without. Maybe a competitor has unleashed a virus in your system. Maybe it’s sabotage. But please focus on investigating these issues.”

Langsford stood taller. Gillian had guessed the man needed to be sent on a mission, so he wouldn’t fall apart emotionally, and she had guessed right.

“Of course, of course,” Langsford said. “I’ll get right on it. Crash, keep me informed about your arm. Gillian, good day.” He made an awkward bow and left the room.

“He’s really very smart,” Crash said. “But as I said earlier, not as smart as Bill Stewart, and Bill is the only one around here I could imagine coming up with generally-reprogrammable nano-machines. Still, we’ll keep an eye on the old boy.”

Gillian looked at Crash’s arm once again and shivered. She gave Crash a weak smile and then left the infirmary.

– 25 –

Melissa Hathaway, founder and owner of Universal Fidelity Corporation, relaxed into swirling bubbles of the hot tub. The not-so-minor issue of what to do with her company if she passed away was bothering her. Lord Charles, her husband and co-owner, had passed away a month ago from a sudden heart attack. It was over in just a few minutes. The man knew how to get things done, even dying. She hadn’t announced to anyone that Lord Charles had passed away. It had taken some “grease” to keep it silent, but she just wasn’t ready, emotionally or financially, to break the news to anyone yet.

She now owned 100% of Universal Fidelity Corporation. It was a corporation that barely existed. The company had no official headquarters, no stationary, no business cards. And yet, spread around the world was \$20 billion in carefully managed assets.

She missed him, of course, but not as much as she had expected. In fact, in her thoughts, he was still with her.

She never hesitated to talk things over with him in her mind.

One part of her felt like letting UFC lapse. Just letting it go. But that was nearly impossible to do, because the company would still have outstanding policies. Day to day management was fairly minimal, because everyone who “worked for” UFC was really a contractor who took care of himself. Still, eventually something would go wrong, or a policy would require a big payout, and if she wasn’t there to sign the check, nothing would happen. And then she would have very unhappy clients and everything she and Charles had worked to build together would fall apart – probably amid many scandals, which would really break her heart.

Melissa was considering this conundrum when the phone rang. She let the answering machine pick up. Hardly anyone had the number here at her Aspen retreat, so it was probably going to be an interesting message. After a moment she heard the message coming through.

It was Gillian’s voice.

“Hello Melissa. Sorry to intrude. I believe I know who is behind the trouble at PMTC. I will be sending some information to you by encrypted e-mail. I will require more resources in order to finalize my investigation and document the corruption. Hope all is well with you. Bye.”

That was an interesting message. Melissa sensed that Gillian hadn’t really wanted to talk – that the message *was* the message.

Melissa doubted Gillian had really made a significant breakthrough. The phone call was clearly a ruse to smoke

someone out. Normally Gillian would never communicate so informally. If she really wanted more resources, she would have emailed a detailed proposal, encrypted with ludicrously large encryption keys.

Well, Gillian was a good agent and could take care of herself. Melissa returned to her thoughts.

– 26 –

Gillian hung up the phone. There was little to do but wait. She thought someone was truly and deeply wired into PMTC to the point where that person could modify the manufacturing processes without anyone knowing. If there was such a person, surely that person would have tapped her phone conversation. She just hoped her ruse wasn't too obvious. In order to help "sell" the phone call, she had used a very private number to contact Melissa. That might lend some credibility to her phone call.

In the meantime, she would work on her follow-up email, as she had promised in the phone call.

– 27 –

The man listened to the phone call. He was already convinced that Universal Fidelity was full of smart people. And agent Gillian was pretty smart. But what kind of intuitive leap would have agent Gillian made that would have convinced her she knew who was behind "the corruption," as she called it?

The only interesting event in the last few hours was her conversations in the infirmary. The man reviewed both

of them, looking for clues. What had she figured out from talking to Langsford? That guy was as innocent and naïve as any scientist could possibly be.

Maybe his innocence had triggered something in Gillian's mind. It was possible Gillian had realized that none of the "usual suspects" were the right ones. Maybe she was casting her net a little farther out.

Maybe it was a ruse, a feeble attempt to flush him out. The man had no problem with that. He was a master of "the ruse" himself.

Regardless of all that, it was time for another accident.

Another fatality.

And the man would be one step closer to his goal.

– 28 –

Gillian had spent the last two hours in front of her laptop, stumped. Every time she started to compose a letter to Melissa, she would stop after the first paragraph, then jump up and walk around the room.

Even though the message would be highly-encrypted, her room was not necessarily a safe place to compose the message. The problem with encryption was that it only covered the transmission of the message. The message would be displayed on her laptop display screen, so if her room were wired with an itty-bitty camera, the contents of her email would be visible to a spy.

So every time she sat down to tell Melissa what was really going on, which was nothing much except more

accidents, she would stop before she got going, afraid she was being spied on. Then she would get up and pace around, trying to figure out a message she could send that would promote her ruse... but since she had already said on the phone that she knew who it was, it would make perfect sense for her to name the person in her email. But she didn't have anybody to name.

So she spent a lot of time pacing. She figured it would look to a spy as if she were having trouble concentrating, which was true. Hopefully the spy wouldn't know why she was pacing about.

And then after a while she would sit down in front of her laptop and consider another way to compose her message. Then get frustrated, and repeat the cycle.

After the second hour she was saved by a knock on the door.

It was Crash Pendleton.

"Hey Insurance Lady, Langsford contacted me about another experiment they want to try in Product Room E. Don't worry, I won't be running it. It will be Langsford. He said it should be pretty amazing. So, what do you say, want to wander over there?"

Gillian sighed inside. Pendleton's attentions were cute but the thought of another nano-tech experiment was less than thrilling. Who would get hurt this time? She planned to stay clear of any experimental or scientific looking activity. These people took too many chances. Bill Stewart had probably kept them under control... although he had his crazy times too. Or were they always this crazy? What did you expect from genius-type people?

“Okay, Crash. But I’m not getting anywhere near the equipment.”

“Me neither. I’ve had enough trauma recently. Check out the arm... good as new, don’t you think?”

The arm didn’t look as good as new, although it moved as if it were as good as new. It was covered in white skin. Not skin-white skin, but flat white, like a sheet of paper. It looked creepy.

“Does it itch?” she asked.

“Not at all. It’s got the micro-controlled morphine drip. That way I get the benefits of the pain killer, but don’t get addicted, since it is topically applied.”

Gillian shook her head again. “It’s amazing how much confidence y’all have in nano-technology.”

Pendleton grinned. “It’s not amazing. It’s what we live with every day. It just seems strange to you because it’s new.”

Gillian agreed with that. “Yup, it’s strange to me. Let’s get it over with. I hope we learn something truly important this time.”

“We learned something truly important last time – that the rogue nano-machines self-destruct and turn to dust. That was huge. And I’m fine, really. This time we’ll be a lot more careful. You’ll see.”

– 29 –

Once again they entered product room E. And once again Langsford was no where in sight.

“Don’t worry,” Pendleton said. “He’s here – you just can’t see him. I’m going to let you in on a secret. Stewart was working on a special project. Only a handful of people knew about it. Most importantly, your insurance company didn’t know anything about it. The project was highly experimental and Stewart didn’t want any interference from your company. He wanted complete freedom to try out his latest ideas.”

“Normally we handle that with a simple exemption to the policy. It doesn’t require secrecy.”

“Well, I don’t know about normal. I only know what Stewart was doing. And I don’t normally associate the word ‘normal’ with anything Bill Stewart was involved in. Anyway, pay attention. We’re about to enter a secret room. There’s nothing normal about this room.”

Pendleton walked up to the wall to the right of the nano-tech scanning and replicating machines. The wall *looked* perfectly normal. Pendleton started to make a pattern on the wall with his finger. After a few strokes with his finger, the wall began to undulate. A little wake, like that left behind by a boat, was left behind where his finger had touched the wall.

“The wake pattern is just giving me some feedback that I’m moving my hand the right way. For the first few seconds, you have to fly blind, so to speak, and just take your best shot at making the right pattern. Otherwise some schmuck might lean against the wall and start making patterns and trigger the door accidentally. That would never do. But the pattern to get into the room behind this

wall is very complicated, and without some feedback it would be impossible to open the door.”

“What door?” Gillian asked.

“This door,” Pendleton said.

And with that, a perfectly normal door materialized out of the wall. First the door frame extruded, and then an outline of the door, and finally the doorknob. After the transformation, the door looked so ordinary as to be unremarkable.

Gillian stared at the door. There had been nothing but a flat wall a moment ago. “Why couldn’t you just put a lock on the door like normal people?” Gillian asked.

“Because if you put a lock on a door it makes it more interesting. A big flat wall is not interesting. People aren’t interested in things they don’t know about. A locked door, on the other hand, automatically begs the question, what’s behind that door?”

Gillian had to agree with the logic. It was the same logic that was behind the virtual nature of UFC – since UFC didn’t have a big building to attract attention, it went unnoticed.

Pendleton continued, “Of course, it’s not too hard to guess that this door is made out of nano-machines. This entire wall is. Let’s go inside.”

Gillian hesitated. She had seen too much nano-tech weirdness recently. “Maybe we should get some more help here before we go in. I’m not too hot on going in there. I’ve kind of gotten nano-tech-shy over the last few days.”

Pendleton persisted. “Really, it’s no big deal. Once you see what’s inside, you’ll realize why I wasn’t too

concerned about getting some nano-tech skin on my arm. This is a very cool project. Things are really pretty far developed. It's perfectly safe. Let me tell you about the project before we go in.

“This project is about making so-called ‘smart skins’ for aircraft wings. ‘Smart skins’ are wings that can change shape about 60 times a second. This technology goes far beyond what a typical airplane wing can do – you know, extending the flaps to make the wing bigger or the moving the ailerons to bank the plane when turning. Smart skin technology solves a problem that has been vexing aeronautical engineers for decades.

“As you may have learned in school, normal flight equations can't explain why a bumble bee flies. It didn't really matter that bumble bees went unexplained since the standard flight equations worked great. Obviously a lot of airplanes had been made that worked just fine. It was just a great curiosity that bumble bees could somehow fly in spite of the fact they weighed too much in comparison to the surface area of their wings.

“The answer to this puzzle came from high-speed photography of bumble bees. The wings on a bumblebee actually change shape while it flies. So the normal flight equations for static surfaces didn't apply to bumblebees. It's taken a long time to figure out what the right equations are that account for the bumblebee wing.

“The general thinking here at PMTC was that if we could make smart skin airplane wings, that actually change shape as the airplane flies, we could make even more efficient wings. Stewart was pretty sure that once he had a

prototype going, he could get plenty of funding – on his own terms – from a big airplane manufacturer. Imagine an airplane that flutters its wings when it lands. There was some thought that portable, human powered flight might become a reality. Well, those thoughts were correct. Come on in and see. It's quite safe."

Gillian wasn't so sure. "Your idea of safe and my idea of safe don't always seem to be the same thing. How do you know someone hasn't tampered with this room, or with this wall? Do these new equations have anything to do with positive feedback?"

Pendleton looked surprised. "As a matter of fact, they do. The wings change shape as the air moves around them and the equations embedded in the nano-machines try to maximize the lift from the wing's surface."

There was a moment of silence.

Pendleton spoke first. "Believe me; the machines are really quite stupid. They 'feel,' if you will, with micro-electronic mechanical gyro systems and then change the shape of the wing to maximize lift. It's not very different from the comfy chair; it's just a different set of equations."

"If you are so sure this is totally safe, then why are you even showing it to me? Why are you breaking the secret? You know, once I know, that all of UFC will know within a matter of hours. We won't ignore something like this. And forget about your smart skin technology – what about this wall and the door?"

Pendleton smiled. "Well, it's important that you have access to all the information. Stewart's out of the picture, so there's no longer a reason to keep it a secret.

Come on. Langsford is inside waiting for us. Let's go in. There are other cool uses for 'smart skins,' like this cast on my arm. The wall is nothing, just a bunch of stupid machines. This is a regular door now, until I hide it again."

Gillian didn't move. "That door is freaky. If you don't care who knows about this, then let's bring in some other people. My ego doesn't require that I know about this first. Some days, like today, like right now, I think I know more about nano-tech than I want to."

Gillian turned to walk out of Product Room E. But Pendleton was beside her in an instant.

"No," he said.

He grabbed her hard by the arm and started to drag her over toward the door. Gillian did a simple twist to get out of his grasp and moved a safer distance away.

"Crash ... What are you doing?"

"I'm tending to the security of this project. That's my job. At least that's the way I look at it."

Gillian continued to back away from Pendleton toward the door to Product Room E.

Pendleton calmly walked over to the wall and stuck his hand into it. He pulled out his hand. He was holding an item that looked like a pistol grip water nozzle. Gillian decided it was time to leave. Just as she turned to run Pendleton fired the nozzle gun at her. A web of cocoon like material shot out and hit her in the face. Gillian suddenly couldn't breathe. She clawed at the material on her face, but Pendleton shot her again and the web-like material anchored her hands in place. Gillian was in a panic. She couldn't breathe and she couldn't use her hands.

Pendleton advanced toward her and grabbed her once again by the arm.

Pendleton hissed into her ear. “I’m smarter than Stewart, and I’m smarter than you, and I’m smarter than all your stupid statistical tables at UFC.”

Gillian side-swiped Pendleton with her leg and caught him behind the knee. Pendleton dropped to the ground. Gillian again tried to run toward the door. “Bad idea, Insurance Lady,” he said.

Pendleton fired the web material at her legs and Gillian tripped and fell hard on the floor. “You’re using up energy. Relax. This is a great way to die.”

Gillian rolled over and looked around the room for something to help her. But it wasn’t any good – she couldn’t even get up. Pendleton came over and grabbed her by the arm again and pulled her up. He started dragging her across the floor to the nano-tech door. He opened the door and pushed Gillian into the room. Gillian slid onto the floor. She was aware of a putrid smell. The room was very white and it was hard to focus through the webbing on her face. As her vision cleared somewhat, she saw something that made her skin turn cold.

It was Langsford.

He was hanging from the ceiling.

He was wrapped in a translucent cocoon.

His tongue was hanging out of his mouth.

He was dead.

Pendleton closed the door and made a pattern on it that made it vanish.

Pendleton advanced on her. “It will be over soon. This only takes a few minutes and it’s really a very peaceful way to die.” He shot more of the web material at her. The world was a blur.

Gillian felt herself panicking and losing consciousness at the same time. She saw a blur of motion out of the corner of her eye and then suddenly some of the web over her mouth was torn loose and she gasped for air. Slowly, more and more of the web was removed from her face and hands. A piece was removed that had been covering her eyes. She could see clearly again. She could see who had saved her.

It was Bill Stewart. She blinked to make sure she was seeing correctly.

“Bill!”

“Sorry. I didn’t know about this room. It took me a while to get through the wall.”

“I was worried you were dead!”

Gillian reached up and pulled Stewart toward her and kissed him passionately on the mouth. Stewart returned the kiss.

They both paused to come up for air. They hugged for several more moments. “Bill! You disappeared on me.”

“Yeah, sorry about that. It’s good to be here. Actually, I’ve been around the whole time. It’s good to know you know that I’m here.”

“Shut up you fool, and kiss me again.”

Stewart was happy to oblige. After a moment Gillian broke off the kiss.

“You son of a- ! Why didn’t you tell me you weren’t going to be there??”

“Aah, well, sorry about that. I knew you’d track me down eventually, since you’re pretty clever at those sorts of things, and I knew I needed more time to work on the equations and figure out that final bug. When you told me that all of the data had gone missing, I knew then we had a mole, and I had to smoke him out. So I just jumped. In fact, I jumped right over the top of you when you very near the top. Uh, I didn’t really have any time to think through the implications of what I was doing. I needed time and I figured it would take days to search the rocks below for my body and in the meantime I could try to track down the traitor.”

“You’re lucky I love you so much. Otherwise I would kill you. Or at least sue you for alienation of affection. Jesus, you do know how much I love you and how much that hurt me, don’t you?”

Stewart looked down sheepishly. “I’m a man, so, no, I probably don’t actually know how much it hurt you. I tend think of everything as a game. Uh, sorry.” Stewart eyes started to water up.

“How did you survive the jump?”

Stewart blinked. “I’ll show you later. Just a little toy I invented.”

Gillian shook her head. “Men,” she thought to herself, and then looked over at Pendleton. He was stretched out flat on the ground. “What did you do to him?”

“Just the old chloroform trick. He’ll wake up in a few minutes. Let’s get some help in here.”

“You’re not going to leave me in here with Pendleton, are you? And how are we going to get out of this room?”

“No, I won’t leave you here with him. But I would like you to watch over him while I reprogram this wall. Here, if he starts to stir, put some more chloroform over his nose. Damn. Poor Langsford. I didn’t know about this room. It’s a very clever application of smart skin technology. This room is completely invisible. And sound proof – the walls dampen all sound. And this cocoon stuff is pretty clever, in an evil sort of way. Pendleton was smart, and if I hadn’t smoked him out, he could have created an ecological meltdown of epic proportions. There were flaws in his equations. The feedback in his systems wasn’t balanced, and could result in uncontrolled positive feedback loops. He was smart, but not as smart as he thought he was.”

Stewart went over and pulled down Langsford. “Good bye, old friend,” he said.

Pendleton stirred slightly so Gillian smothered him in some more chloroform. “Let’s get some help in here, okay?”

Stewart looked up from Langsford. “Okay.”

With that, he walked over to the wall and started to trace his finger on it. At first nothing happened, but then the wake pattern started to appear. The patterns almost reminded her of the patterns she used to enter text without a

keyboard into her PDA – Graffiti she thought it was called. And then the door appeared.

And when Stewart opened the door, Gillian breathed a big sigh of relief.

They were free.

– 30 –

Gillian and Bill Stewart were in bed together, relaxing in each other's arms with a post-coital buzz.

Stewart was whispering in Gillian's ear. "I really missed you. It was hard following you around and being unable to contact you. It's good to be able to touch you again."

Gillian whispered back, "It's good to be touched. I'm sorry I called you an asshole. I was just a little panicked."

"An inability to breathe has been known to make people panic." He smiled at her. "This whole thing was pointless. Pendleton didn't really know what he was up too. And working in secret, first by stealing my ideas, and then enhancing them in his awkward way, resulted in errors that our normal peer review system would easily catch. I have someone review all the work I do – everyone can make stupid mistakes. He should have worked with us, instead of against us. What a waste.

"He was a lot smarter than the psych profiles showed. As the head of security, he had access to the main computer and changed his profile. He made that invisible room. He made that cocoon-like gunk, and the nozzle-gun suitable

for shooting it. He rigged the nano-machines to get locked in a positive feedback loop, which killed Smythe. He programmed the machines to turn to dust afterward.

“Unfortunately, he didn’t quite have the mathematical background to really understand what he was doing on a deep level. There were subtle problems with his mathematics.”

Stewart rolled over on his back and stared at the ceiling.

“I was working on that buzzing sound that we thought was a bug when I realized someone had been tampering with the programming. That’s when I retreated to my cave in Nepal – so I could do some serious research without disruption – and hopefully without any prying eyes from whomever it was that was reprogramming the machines.

“As I began to figure out how the programming had been altered, I realized that a positive feedback system had been put into the machines *on purpose*. This disturbed me greatly, because due to an error in the mathematics of the programming, these machines could potentially get into an infinite feedback cycle, and potentially start destroying all the matter they came into contact with. If enough of these machines got out of control, it would be a *China Syndrome* like disaster – a systematic release of energy that would cause the machines to bury into the Earth. They would continue to consume energy and matter until they self-destructed from the heat. But I had no idea when that would be. The potential for a serious ecological event was huge. If the burying machines hit a pocket of magma

before burning themselves out, then a mini volcano would be created. And who knows how it would spread from there... I had to find out who was behind this.

“After thinking about it I thought to really get the bad guy to reveal himself he would need the self-confidence that came from knowing I was missing. So I jumped.

“Thanks for helping me. I love you. I’m sorry I misled you. Jumping just seemed like the right thing to do at the time.”

Gillian rolled over on top of Stewart and kissed him. “I love you too. Next time think about me before you jump off a cliff.”

– 31 –

Bobby “Crash” Pendleton was back in the infirmary. This time he was tied down to his hospital bed. He was slowly returning to consciousness as the drugs wore off. As he became aware of his surroundings, he tensed a muscle in his left arm. A shot of caffeine was released into his bloodstream and he was suddenly more alert.

Pendleton started to consider his situation. He had been on a roll and now he had hit a big bump in the road. Secrecy was such a great thing. Now his secret was out. Or at least one of his secrets. Fortunately, he still had some surprises up his sleeve.

Literally.

Pendleton had two arms with synthetic skin. One was his right arm, which had been injured in the accident, and was now covered with some obviously artificial skin.

The skin on his left arm, and several other body parts, including his face, was nano-tech. He was a walking, talking nano-tech machine. And he was certain from the lackadaisical way he had been tied to his hospital bed that his secret was still secure. Pendleton could rip off his bindings at any time and escape.

But was that the best plan?

It seemed worthwhile to really think things through. He was lucky to have this second chance. He gave himself another shot of caffeine and relaxed into the buzz. Insurance Lady didn't know what she was missing. Sleep was such an irritant. Why bother with it? Caffeine was *yummy*.

And he had guessed right about Insurance Lady. She wasn't super smart, and he would have succeeded in killing her if it weren't for Stewart. He could have left her in the room with Langsford as the apparent victim of an industrial accident she would herself have caused while killing Langsford. He'd already planted some "rogue agent" evidence in the computers. That evidence was probably still in place. It might come in handy later.

But he hadn't counted on Stewart coming back. Stewart was such a tech-weenie – Pendleton had been sure he'd been off somewhere going over his damned equations and wouldn't be around while things melted down. Or was this a plan someone had set up from the start?

Maybe someone at UFC had come up with the idea of hiding Stewart. Maybe it was Insurance Lady. Maybe she was smarter than he suspected. Or maybe it was just random timing.

Pendleton reflected on what a bad idea it was to underestimate one's opponent. He wouldn't make that mistake again. One of his highest priorities going forward was to hack into the UFC computers and get psych profiles on the UFC people as soon as possible. That had been his mistake – he didn't have complete information and had therefore underestimated his opponent.

One thing in his favor was that his opponent was now underestimating Pendleton. Which was a good thing, but it irritated him. Actually it pissed him off. Why was it so hard for regular people to recognize his genius?

Maybe it takes one to know one. But Stewart hadn't recognized the brilliant potential in Pendleton. Otherwise he wouldn't have wasted him on security. Stewart should have had Pendleton designing products. Cool products.

Or maybe Pendleton was just so smart it was incomprehensible to someone like Stewart that such genius could exist. Maybe Stewart couldn't imagine anyone smarter than himself.

Pendleton sighed. Recognition was so easy for Stewart to achieve and so hard for himself. Life wasn't fair.

Soon it would be time to even things out. But first, he would play possum and bide his time.

– 32 –

Gillian and Stewart were lying next to each other in bed. It was Stewart's turn to ask some questions. "What

does your company do with people like Pendleton? Do you take him out back and shoot him?"

Gillian answered, "Some days I wish it was that easy. Well, not really. I don't want to kill anyone. No, what we do is destroy his ability to make mischief in the future. We use some fairly tricky connections we've developed over the years to make sure the man is financially ruined. He could probably get a job flipping burgers but that's about it. We keep track of him, on and off for a few years, to make sure he doesn't have a stash of cash hidden somewhere. We notify all the police departments in the world that the man has been identified as a murderer and to be on the look out for him. So while we might not lock him up or put a bullet in him, some other government might decide to. Right now, we're keeping him sedated until we fly him out of here and drop him off somewhere away from this island."

"What if no one will take him?"

"So far we haven't had that problem, but if things ever get to that point, I guess we'll have to drop him in the ocean and let him swim for it. And of course, all the security here has been changed so he can't get back in here. And since he was head of security, we've scrubbed the system from top to bottom to make sure he didn't leave any surprises behind."

Gillian turned to Stewart. "Pendleton was telling me about smart skins for wings. Was that real or was that something he made up to get me in that room?"

Stewart smiled. "It's real. Sorry I kept it a secret. Sometimes I can't resist a little tinkering on my own. I

built some wings and that's how I got up to my cave. I flew. I flew through that thin air with nothing holding me up but some nano-tech wings. Want to go flying?"

Gillian reflected on what she had been through recently and she had to admit that trusting her life to more nano-tech was not very high on her list. Still, she trusted Bill. "Can I stay close to the ground at first?"

"Sure, that's one of the great things that these wings give you. You have so much control. You can hover a foot off the ground. You don't need to be moving fast to stay aloft. It's a hundred times better than parasailing, and you've done that before."

Gillian figured she could handle it. But first she snuggled closer to Bill and thought about another way to fly.

– 33 –

Gillian and Bill Stewart walked down to the end of the purple hall, past all of the product showrooms. At the end of the hall was a door – Gillian assumed it was a real door. Stewart opened the door with a wave of his hand and they entered a cavernous room. The room, which was the size of a football field, was surrounded by red lights and cameras mounted on the walls. Slightly dimmed overhead incandescent lights provided most of the visible light.

"It's kind of dark in here," Gillian observed.

"Yup. This is our flight test area. The cameras and infrared lights surrounding the field light up small markers on the wings so we can track the actual movement of the wings in different configurations. The lights look red

because they bleed over into the visible spectrum but actually they are pumping out a massive amount of infrared. The cameras are very sensitive to infrared. The wings have tiny markers on them that reflect the infrared light back to the cameras. The cameras run at 180 frames a second, and when their collective images are fed into a network of computers, a 3D track for the motion of any infrared marker is created. The motion of the wings is too subtle to see with the human eye, so we have this augmented reality system for watching everything that goes on. We convert it into 3D data that we can slow down and analyze later. We don't need it much anymore, since the wing technology is pretty solid. Still, it is a prototype, so you don't have to fly over a foot off the ground if you don't want to."

Stewart led Gillian over to a rack holding rows of wings. "I seem to recall you weigh about 135 pounds. At least that's what it feels like when you're on top of me." He gave her a grin, like the cat that ate the canary. He selected a pair of wings for her. He reached around Gillian's waist, chest and arms to secure the wings to her torso. The wings were folded down flat against her back. They were translucent and looked extremely fragile but were in fact very strong and resilient.

"How am I going to control this?" Gillian asked.

"With your body weight, primarily. Just lean into the direction you want to go, like a Segway motor scooter. To go up and down, you just tilt this little tube I'm going to place in your hand. I've got it set on "beginner", which means any fast moves will be ignored. I'll Velcro it via a

short cord to the straps on your wings, so if you drop it you can retrieve it. If you do drop it, the wings will lower you to the ground at a rate of one inch per second, which gives you plenty of control and feels very safe. Once you're in the air, be sure to drop the vertical control tube so you can experience what happens and get used to it.

"Now, hold the tube in your hand like this." Stewart placed her hand around the tube with her thumb on top of the tube, "and you'll be ready to take off. Just press down on the button, then tilt the tube back to go up, and tilt forward to go down. It's all in the wrist. If you let go of the button, you'll slowly descend. The wings won't let you fly too close to a wall. If for some reason, you do actually manage to fall, you'll be happy to know that the floor is padded."

"And if you panic, which you won't, but if you did, and started waving your hands all over the place, then the wings will also slowly lower you to the ground. And if you freeze up and grab that tube too hard, because you're having a different kind of panic attack, you'll also be lowered to the ground."

Stewart walked around in front of Gillian. The wings wouldn't start while he was near them.

Gillian looked Bill Stewart in the eyes and pressed down on the thumb sensor. Nothing happened.

Stewart continued, "Every time you push down on the button, the tilt is recalibrated, so that you don't have to worry about having your wrist tilted exactly right. If you tilt that little tube back now, you'll go up, slowly – about an inch a second."

Gillian tilted her hand back.

And floated off the floor.

Gillian didn't move a muscle in her hand, or so she thought, but apparently she wasn't panicked enough, because the wings kept lofting her higher. When she was a couple of feet off the floor, she let go of the button. And floated gently back to the floor.

"Wow," was all she said.

She had felt the straps pull slightly against her but it wasn't uncomfortable. She had a thought.

"Are these straps nano-tech?"

Bill smiled. "Uh, yes. I didn't think it was worth mentioning. But if they didn't automatically adjust, you're blood flow would get cut off and it would be very uncomfortable."

Gillian sighed to herself. There was no escaping it.

Well, it was time to fly.

Gillian pushed down on the thumb sensor and tilted the control tube back. She waited until she was about four feet off the floor and then straightened her wrist. She hovered in space. There was a whooshing sound behind her as the wings generated the lift that kept her floating in space.

Gillian thought about going forward and her body subtly leaned forward. She started flying forward. Bill stepped deftly out of the way and watched her fly by.

"Not bad, eh!?" he called out to her. But she was too busy concentrating to respond. Bill went over and strapped on his own wings. And then he took off to fly around the cavern with his lady love.

Bill's wings were on expert – he had been flying for months. He felt a great need to show off for Gillian, so he flew circles around her, laughing. The wings moved very fast. The wings were nothing but a shimmer of light behind Bill.

Gillian was starting to relax into it. She discovered that moving the control tube to the right or left turned her; otherwise simply leaning her body one direction or another would move her in that direction without turning, like a helicopter. She practiced flying from one end of the room to the other. Bill chased her and circled her and flew above her and below her.

It was an ecstatic aerial dance, but Gillian was getting tired from concentrating. It would take some practice to truly relax into the experience of flying. Gillian settled down in the middle of the big room. Bill came zooming in and landed in front of her.

“What do you think?”

“I think it's brilliant! But I'm going to need some time to get used to this.”

“Sure,” Bill said. “It takes about four hours for someone to really get comfortable with it.”

“You know I have to tell UFC about this.”

“Sure, it's okay. Just write a waiver. I have two other secret projects going that I can tinker with.” With that, he smiled and took off, with that cat-that-ate-the-canary grin plastered on his face again. “Boys and their toys,” Gillian thought to herself. It was a good thing she was around to keep boys like Bill Stewart from getting killed by men like Crash Pendleton.

“You know, we need a break,” Gillian said to Stewart over dinner.

“I don’t need a break,” Stewart replied. “I like working.”

“Well, I was thinking we could go check out the resort that UFC is funding. I can get permission for us to stay in one of the more finished parts of the hotel. It’s practically done. We could be guinea pigs. You can bring your laptop and check out the connectivity there. You should be able to tunnel into the computers here. You can verify the security of the connection. And I can help you, you know, relax in the evening.”

“I’ll think about it. Say, have you guys worked out what you’re going to do with Pendleton?”

“Melinda decided to pay the British government to prosecute him. We’ll fly him back to Britain to stand trial. Someday we’ll develop some infrastructure of our own to handle problems like this, but we’re just not there. And we’re going to have to pay them extra to hold the trial secretly. Luckily the U.K., due to its cultural history of things like the Official Secrets Act, is a lot more amenable to something like that than the U.S. There’s better infrastructure in the U.K. for secret courts.”

“Would you try to get the death penalty? After all, he killed Langsford and Smythe.”

“Probably not. Would you kill an innocent person?”

“Pendleton isn’t innocent.”

“I didn’t ask about Pendleton. I just asked if you are willing to kill an innocent person?”

“Of course not. What’s that got to do with anything?”

“It has to do with the principle that people make mistakes; in this case, neither one of us actually *saw* Pendleton kill anyone, did we? Do we know with 100% certainty that he’s guilty? Maybe someone else in your organization was setting him up.”

“That’s ridiculous.”

“Not really. Weird things happen. So we avoid the death penalty, not because we don’t want to kill him – I’d happily put a bullet in his head myself, *if I knew with 100% certainty he was guilty*. As you know, we do a lot of statistical modeling in the insurance business, and we’re never 100% sure of anything. And death is really final. So we’d move to lock him up forever, even though that’s going to cost us about \$75,000 a year, because we’ll reimburse the U.K. government for jailing him. Just in case of a mistake.”

“What if I had just shot him instead of knocking him out?”

“Then we’d be investigating you. And you’d probably be cleared. But the question is the same: Would you be happy knowing you *might* have killed someone in error?”

“What about wars? Mistakes are made in wars; friendly fire, civilian casualties, and so on.”

“War is a mess; war is real-time. You can’t directly compare that to what happened here. Underlying both

situations, though, is the same principle – if you had to make a real-time decision and you killed Pendleton, then at least you would know, or at least believe, you had done your best to make the right decision given the time you had. But if you'd come into the room, guns blazing, and then found out later that you'd killed the wrong guy, where would you be then?"

"But in Pendleton's case, he's evil. What if he breaks out of jail and causes more mischief?"

"Then you better put your mind to developing better jail technology, to make sure he doesn't break out."

"Hmm. Jail technology. Okay, I'll think about some cool jail technology. For \$75,000 in annual expenses, I might be able to come up with something better than a big concrete building."

"So what about some vacation time? You can bring your laptop and think great thoughts and we can relax in the evenings."

"Okay, I guess so."

"I'll make sure we get the best suite in the place. Relax, it will be fun!"

"I think I mentioned that I relax by working, but I'll bring along some work. Then it will be fine."

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Pendleton flexed his arm slightly and another shot of caffeine entered his bloodstream. "What to do, what to do, what to do, ..." he muttered to himself. He relaxed a bit. Caffeine. "It perks you up and calms you down," as an old

coffee commercial put it. He forced his body to relax some more. An opportunity to get free would present itself soon enough. Pendleton decided to lay off the caffeine in case someone came in to measure his stats. No point in alerting anyone that there was anything except a slightly drugged murderer in the room.

– 36 –

Melissa Hathaway, founder of the Universal Fidelity Corporation, sat mulling over the need to build a better police force and justice system in Anegada. She'd been avoiding this problem for as long as possible by doing background checks on everyone she or one of her clients hired. She had figured that if she hired good people then her need for any kind of internal police force would be minimal. She'd been right up until now, when things had gone south in a most spectacular way. Now she had one of her client's head of security accused and guilty (to a high degree of confidence) of double murder.

For now, she was going to "out source" the justice part of the whole thing, and basically run the whole problem through the U.K. justice system, such as it was. The trick of course would be to call as little attention as possible to UFC and any of her clients. Well, the U.K. had sponsored the free trade zone in Anegada, so they wouldn't be too surprised if something bad eventually happened there. She'd make sure most of the focus would be on PMTC as a business located in the free trade zone and that her own mega-insurance company would be left out of it.

It was messy. She was going to have to architect a free enterprise justice system. Life was so much easier when one dealt with essentially moral people with a reasonably constrained range of human foibles. Her old justice system, which basically consisted of simply firing people, stripping them of as much of their credit rating as possible (depending on the severity of what they had done) and making sure they didn't come back, wasn't really adequate for a crime this severe.

For one thing, Pendleton was clearly very smart and his motives were fueled by revenge and a psychotic need for recognition. Simply firing him and leaving him destitute would be inadequate. He'd just hook up with some third-world crime lord, and get a bunch of funding based on promises to deliver the world's best nanotechnology to the crime lord, who would undoubtedly use it for some nefarious purpose. It would be like Saddam Hussein or Hitler – they started out small, beating up on the locals, and then as they gained power, they started beating up on their neighbors, and then the next thing you know, you were looking at a potential world war. So, crazy as he was, they'd caught Pendleton early in his evil career, which was a good thing, and would prevent a lot of mischief later on. Although, Melissa remembered, Hitler had spent a few years in jail for treason, early in *his* career, and still ended up Supreme Chancellor of Germany.

Simply smacking Pendleton down wouldn't be enough. It was the kind of thing where you wanted to arrange an "accident" just to eliminate the problem and save a lot of money. Trials and the warehousing of people

in jails were so expensive. And surprisingly ineffective. The more people that were put into prison, the more of a “critical” mass of information on how to screw one’s neighbor was accumulated and distributed amongst the people who were most likely to use it. Prisons created more crime than they prevented.

The problem, of course, was that the “small town” jail *did* work, because it only held a few people for a short period of time. It wasn’t a breeding ground for more crime. But the “small town” system didn’t scale up. As bad people got “promoted” up the system into supposedly more secure jails, they tended to share information and brag and generally encourage each other in their evilness.

There would be a lot less breeding of criminal intent if modern prisons didn’t let the prisoners ever talk to each other. Putting everyone into solitary confinement was considered inhumane, but Melissa wasn’t so sure about that. Inhumane to whom? Breeding criminal behavior was inhumane and didn’t make society or the individual crooks better people. Maybe if everyone was kept separate in prison then the total sentence time could be reduced, which would free up a lot of prison space, reducing costs, and reducing the breeding of criminal intent. Melissa made a note to do some research on solitary confinement. Did criminals sit and think about their crimes and “come to Jesus?” Civilized people recognized that time alone, reflecting on life, was a good thing. Did it work for criminals too? Or did they just sit and stew and let the resentment grow?

Crime was messy. And it didn't help that the vast majority of the criminal population was suffering from depression or some other mental disorder. The idea of putting everyone into a mental hospital wasn't too great – it would be less secure than a prison. Maybe a modern prison should do a lot more psychiatric evaluation. It was mostly limited now to making sure someone was sane so they could be executed, which was the strangest thing ever.

Modern medicine for getting people out of depressive states was far more effective on a far larger population than had ever been true in the past. Just handing out Prozac would probably make society safer, and had to be cheaper than warehousing people. That plan would only work if the crooks stayed on their meds. There wasn't much guarantee of that. You could embed the Prozac delivery system in their body, so they wouldn't have any choice about it. Or maybe solitary confinement coupled with modern drug therapy was a good idea.

Ugh. It was messy. But Melissa had enough ideas to order some statistical studies that might shed some light on what would be cost-effective, humane, and effective in the long run. In the meantime, they would keep Pendleton sedated and send him off to Britain for a trial and eventual incarceration.

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It was mid-afternoon as a military medical helicopter with British markings approached the landing pad at PMTC in Anegada. It was there to ship a sedated Pendleton to

Britain for trial. It touched down gently and two orderlies and an M.D. exited the craft and headed down to the PMTC security entrance.

Two hours later, after enduring the PMTC security systems, they returned to the helicopter, this time wheeling a gurney with Pendleton strapped to it. Various hookups monitored Pendleton's physical condition. In principle, even if the sedation wore off, Pendleton was fastened securely enough that there would be no trouble. Still, it was less stressful for everyone if Pendleton was kept asleep. After Pendleton was loaded onto the craft and everyone was secure, the helicopter took off into the sunset. Everyone at PMTC let out a collective sigh of relief. The crazy guy was gone.

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Gillian and Bill Stewart relaxed in a large hot tub built into the balcony outside their room at the Anegada Island Resort. Bill was such a workaholic that it was a major achievement anytime Gillian managed to get him to take a break. She always used the same trick – “don't worry, bring your work with you.” Stewart could relax if he knew his laptop and an Internet connection were nearby. From their top-floor penthouse, they watched the military helicopter fly off into the sunset. Like everyone at PMTC, they sighed in relief. Now, with the database restored, and Pendleton gone, everyone could get back to work, and focus on a successful product rollout.

There was going to be a memorial service for Smythe and Langsford at noon the following day. It was going to be held on the beach next to the ocean and promised to be a beautiful ceremony. From their vantage point on the penthouse balcony, they could see chairs and a podium set up in anticipation of the event.

Gillian nudged Stewart's leg with her toes. "A penny for your thoughts?"

Stewart laughed. "The current rate for my thoughts is quite a bit higher than that. But you can have a special deal. I was thinking about your comment that we don't *know* with 100% certainty we've actually solved our problem with Pendleton – there might have been an accomplice we don't know about. You know, if I thought that way all the time I'd be paranoid."

Now Gillian laughed. "In the insurance business, we do think that way all the time, and we are paranoid! Or at least most people would say we act paranoid all the time. That's why people hire us."

"So how can you be sure Pendleton acted alone, or didn't leave a virus behind in our computer systems, or whatever?"

"We'll continue scrubbing the entire computer system from top-to-bottom, and making sure we identify and account for every single way into or out-of the computer system Pendleton might have had. One thing that could happen is even if Pendleton didn't have an accomplice he could have left a backdoor into the computer system. Then he could hire an accomplice from prison to re-break-into the computer system, thus putting the entire

project at risk again, or giving him the opportunity to sell your intellectual property to a despot, which is something we really want to avoid. It's kind of like airplane crashes – every time one happens, it gets analyzed to death, and things get that much safer. But we never get to 100%, I'm sad to say. 100% security is a goal, not a real achievable state. Although for some of our clients, our record is so good, that when something does finally go wrong, they are genuinely shocked.”

Stewart stared into space. “Well, this nano-technology is so powerful we should proactively review all the measures that have been put in place to keep competitors, or maybe even despots as you say, from running off with it. I would hate for a loophole in our product security systems to exist and for this cool, fun technology to turn evil.”

“Speaking of which,” Gillian responded, “why do you have secret projects under way all the time? Don't you think it would be better to engage us at UFC as a partner in keeping your secrets instead of hiding them from us?”

Stewart considered her request. “Well, as I said, this nano-technology work we're doing is really powerful; I was just hinting at some of the possibilities. Some of the applications I've thought up are kind of scary. I figure as long as they only exist in my head and in my private lab then the world is a little safer. What was that Chinese saying? ‘Two can keep a secret if one of them is dead.’ One of the things I've had to deal with, and this sounds very egotistical, because it is, is that I'm really smart.”

Gillian laughed at the understatement.

“Seriously, it’s easy to think, what the heck, someone else will invent this stuff eventually. Everyone thinks that the march of technology is inevitable. But it turns out, historically, a lot of really good ideas have been lost, some forever, others for hundreds of years. We only find out about them when some manuscript is found buried in someone’s attic. You have to wonder if the human species is really ready for a lot of the technology we’ve created. Once the genie is out of the bottle it’s hard to get it back in. Information spreads so quickly. Even if a perfect digital copy is made of some of our plans, it can be read out of context, and then the information actually degrades, because a lot of information only makes sense in a certain context. You can’t really control it. Fragments of information spread even faster, like viruses. It’s the whole urban legend effect. Behind most urban legends is some small fragment of truth that has been repeated and distorted and taken out of context and twisted until it has a life of its own.

“Or worse, an early or incomplete version of a product spec gets stolen, before we’ve worked out all the issues. The person who’s stolen it doesn’t know how complete it is. They haven’t been involved in the creation of the product or idea. Charles Babbage wrote a complete design for the first digital computer but never built it. When it was finally built, a hundred years later, little errors in the design were found. The overall design was fine – in fact, it was excellent. A guy named Doran Swade wanted to figure out if the design errors were fundamental, and Babbage’s machine would never have worked, or if these

errors were the typical little things that would have been worked out when it was actually constructed. Swade took his history seriously so he tried to interpret Babbage's plans in the context of the times when they were made. The generally accepted belief before Swade's work was that Babbage's machine couldn't be made with the technology of the time, but in fact, it wasn't built simply because it took too long to make all the parts, and Babbage, who had a way of pissing people off, failed to maintain the funding for the project. It was only by going back and trying to understand Babbage's work in the context of the time when it was built that Swade was able to reproduce what would have happened if Babbage had managed to complete the project. Swade actually built Babbage's design. There were things in Babbage's design that nobody understood until they saw the whole thing working. The context had been lost. It turns out the machine worked with just a small amount of debugging by Swade and his staff. Babbage really did invent the first digital computer, and his assistant, Ada Lovelace, really was the first programmer.

"Well, that's a long winded way of telling you that I like to keep some things secret until they've been worked out in sufficient detail and with enough of the context documented that the work won't be lost or misinterpreted by others. It's my own bit of social responsibility."

Gillian considered his statement. "Perhaps as UFC itself matures, we'll find ways to protect information of the kind you've described, without potentially compromising it, simply because more people are involved. In the short term, maybe secrecy is the best thing."

Gillian continued, “But you know, Pendleton knew about your wings. You didn’t keep that completely secret. Maybe once you start to involve other people you should bring in UFC at the same time. Because once you’ve told one person, you’ve passed over that ‘two can keep a secret if one of them is dead’ boundary. So you should let us bring our security and encryption technology to bear on keeping your secrets. If nothing else, we can embed virtually undetectable watermarks into every version of every document, thus allowing us to trace who caused a leak if it happens. It’s better than nothing. What if Pendleton was less ambitious and had just stolen the plans for your wings to sell them? If we ever once managed to see a copy of those plans we’d instantly know it was Pendleton who had done it.”

“Okay, well, I’ll keep it in mind. But in the meantime, there’s lots of cool stuff that only I know about, and it’s going to stay that way.” Stewart relaxed into the swirling hot water.

“You know, I’m secretly glad when you talk me into this kind of break. Sorry it’s so hard.” He smiled. “I like working.”

Gillian smiled back. Stewart was so appealing when he let his guard down, which was rare, but it had been happening more and more around her. They both settled into the hot water and relaxed into the moment. The sky was slowly getting darker as the sunset progressed. They watched the sun reflect off the ocean as it tucked itself behind the horizon. It was beautiful.

Pendleton felt extremely relaxed as the helicopter lifted off from PMTC. He listened to the various beeps and other sounds of the medical monitoring equipment. As long as he kept his body relaxed everything would be fine on the monitors. It felt good to be in the helicopter where he was much more in control of the situation. PMTC had too much security for him to make his next move. But here in the helicopter he felt he could easily overpower the few people who were in it.

Pendleton flexed his arm to bring himself to full wakefulness. He heard sounds from the medical equipment change their rhythm. That would bring someone closer to check it out. Pendleton opened his eyes and looked around. By now, they would know he was awake, just from the monitoring equipment, so there was no need to pretend to be asleep. They would have no idea until it was too late just how awake he was.

The first orderly, a big burly man, approached to make sure none of the monitoring wires had fallen off. He fully expected that Pendleton was mostly “out”. He was quite surprised when Pendleton, with one swift motion, reached up and stabbed his fingers into the man’s throat, cutting off his wind pipe, and preventing him from yelling. Pendleton pulled his bloody fingers out and with another swift motion hit the man on the side of the head, knocking him out. He would be dead in a few minutes as he drowned in his own blood. So far, no one had noticed the sudden activity, even though the medical machines were beeping with increased frequency and urgency.

When the second orderly, a much smaller man, finally noticed the increased beeping, he turned to ask the first orderly how it was going. “Hey Frank, ...”, but his voice trailed off. Pendleton had broken free from his straps, and he kicked him in the chest, breaking a few ribs, and sending him slamming against the side of the helicopter. The M.D. started to fumble in his bag for a more powerful sedative, but Pendleton delivered a quick kick to the head and the doctor fell unconscious. Pendleton rolled off the gurney and slit the second man’s throat with a very fast swiping motion. All of the blood was making a mess in the helicopter. Pendleton removed the wires that were still attached and monitoring him. He turned off the machines. There was a security door between him and the pilots. The pilots up front had no idea anything had changed.

Pendleton flexed his muscles, which he had reinforced with nano technology. He reached down to where the blood was gurgling out of the second orderly and pressed his hand against it. His hand seemed to absorb the blood. Pendleton felt a surge of energy as the molecules in the blood were filtered and converted straight into energy to power his nano-tech body. Pendleton quickly drained the blood from both men as he charged up his body for an attack on the security door. It felt good.

Rather than crash through the door, Pendleton decided to simply dissolve it until it turned to powder. He reached his hand out toward the door and a stream of nano-particles emerged and splashed against the door. The door began to dissolve and a flood of particles returned to

Pendleton's hand, giving him increased power. Pendleton could convert nearly anything into power.

Power. That's what life was all about. Pendleton had a lot of power.

The helicopter pilots were oblivious as the door behind them was silently dissolved and converted into energy. Pendleton moved behind the copilot and quickly snapped his neck. He reached down and took his sidearm from the holster at his waist. Pendleton had more power in his little finger than the gun had, but the remaining pilot would probably respond better to an old-fashioned pistol pointed at his head.

The helicopter pilot made a move for his sidearm. "Don't even think about it," Pendleton told him sharply. Pendleton moved over to him and pressed the barrel of the pistol against the pilot's temple. With his other hand he removed the pilot's sidearm and pushed it into his own waist band in the small of his back.

"Turn the helicopter around. We're going back. I forgot to do something before we left."

The pilot turned the helicopter around.

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Gillian and Stewart were toweling off after their private *soiree* in the hot tub. Gillian was staring idly out the window as she used a second towel to dry her hair.

The helicopter carrying Pendleton had receded to a mere dot on the horizon.

As Gillian watched, she realized with surprise that the helicopter was now growing in size.

It was coming back.

“Bill... the helicopter is coming back. I hope they didn’t have a mechanical problem. I don’t want Pendleton around while the chopper gets repaired and we wait for another helicopter.”

Stewart had a towel wrapped around his waist. He walked over to his laptop and brought up an instant messenger client. He IM’d security over at PMTC. “Pendleton chopper returning – why,” he typed.

“No communication from chopper,” scrolled onto the screen.

“Sound alert,” he typed.

A siren wailed in the distance. Gillian and Stewart quickly dressed. The helicopter continued its approach to PMTC.

A couple of minutes later, as Gillian watched from the hotel room window, she saw four PMTC security guards emerge onto the helicopter pad, weapons drawn.

After that, everything seemed to happen in slow motion. As the helicopter approached it failed to slow down and hover as it would for a normal approach. Instead, it flew straight into the ground and exploded. The four security guards were engulfed in flame.

The sound of the explosion reached them in the hotel a few seconds later. And a few seconds after that they felt the heat of the blast. The helicopter had been filled with fuel for the long trip ahead. A small mushroom cloud was

rising several hundred feet into the air. Bits of burning debris were scattered all around the landing pad.

There was no motion from the security guards. It was a disaster. Everyone must have died in the crash. What the hell had happened?

Gillian and Stewart watched as more security guards came up out of the sandy floor. They started to put out the fire with impossibly small fire extinguishers. Gillian expected that ultimately they would have to let the fire burn itself out.

Gillian asked Bill, “Good God, Bill, what do you think happened?”

Bill thought for a moment, and then said, “I think that either Pendleton crashed the helicopter or the pilot crashed the helicopter. If it was the pilot, then things could be much worse than we think... Something really bad might be happening here if the pilot sacrificed himself... If it was Pendleton who crashed the helicopter after trying to take it over, then we are left with the problem of how Pendleton got control... Now that I think about it, no matter what happened, we have a potentially serious problem here, because the only scenario that doesn’t involve Pendleton taking control or attempting to take control of the helicopter is the scenario where the chopper had a mechanical failure and had to return and the crash was an accident. But based on the way the chopper went straight into the ground, I would say the crash was deliberate... And that means we better get down there and see what’s what. There is a chance that Pendleton survived the crash, and the implications of that are rather frightening.”

The flames surrounded him, and in a strange way, comforted him.

His nano-tech skin absorbed the energy.

He felt like he was the strongest man alive.

He felt like he could live forever.

That fucking pilot had crashed the helicopter.

At first, as Pendleton watched the ground approach, he was angry at the pilot. The fool was committing suicide! Altruism. What was that all about? People are so strange, he thought.

But as the flames enveloped him and he felt the energy surging into his body, he realized the pilot had done him a favor.

Everyone would think he was dead.

“I’m dead,” he thought to himself. “Cool.”

Being dead was an even better cover than being head of security.

Pendleton watched through the flames as four more security guards emerged from the underground entryway and started to try to put out the fire. He crawled along on his stomach, hiding amongst the debris. Nobody saw him move. When Pendleton was about twenty feet from the nearest security guard he simply stood up and ran at him.

He swung his arm at very high speed and decapitated the guard. Then he jumped and kicked each security guard in turn, mortally wounding each one with blunt trauma to the chest. Their fire extinguishers fell to the ground. Pendleton walked over to one of the guards and looked at his own reflection in the guard’s helmet. His face and skin

were pitch-black. His clothes were in tatters. He was the scariest looking mother-fucker he'd ever seen.

Pendleton walked over to the entrance to PMTC. He blasted the door and then let himself in. He thought about revenge. What would be the best way to destroy this place?

Pendleton stopped just inside the first security checkpoint. His first priority was to disable the camera network. He didn't want anyone tracking his movements. Stewart would probably retreat to his lab, which would give Pendleton some time to get to the security center and disable the cameras before he went after Stewart and that pain-in-the-ass insurance lady.

Damn, this felt good. The power literally flowed through his veins.

Pendleton began making his way to the security center. As he passed each camera he reached out his hand and emitted a stream of particles that fried the electronics in the camera.

Damn, this felt *really* good.

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Robert "Bobby" Lightener was on duty in the security center of PMTC when the helicopter crashed. It was the worst thing he had ever seen in his life. The crash had been captured on multiple cameras. The explosion was enormous and he felt it shake the building, even though he was underground. As Bobby watched the monitors he saw a black figure emerge from the wreckage and decapitate one of the security guards who had gone up to put out the

fire. And then, mysteriously, the black figure jumped an incredible distance and struck first one, then two, and then the third remaining security guard in the chest. Bobby froze like a deer in the headlights of an oncoming car. It was probably only ten or twenty seconds as Bobby watched the black figure walk over to the door to PMTC and let himself in. Then he shook himself awake and hit the alarm for the second time in the last ten minutes.

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Gillian and Stewart took the elevator down to a basement tunnel that led to PMTC.

Bill Stewart said, “We’ll go in the back way, just in case Pendleton survived the crash.”

Gillian had to ask, “How could Pendleton have survived the crash? You saw what happened. The explosion was so big there was a little mushroom cloud. Nobody could survive that.”

Bill looked a little sheepish. “There are a range of possibilities, depending on how much technology he has stolen from me. You know about the nano-tech arm that gave him a layer of skin to help him heal. Well, that was actually a pretty simple implementation of a more complex system that I developed privately.

“I really do need to rethink this secrecy thing. I figured secrecy was the best security, but maybe ... well, maybe not.

“Anyway, I’ve developed a lot of technology to enhance the human body. One of my goals was to make it

completely seamless, so that it integrated perfectly with the human body. That also makes it fairly hard but not impossible to detect. So it's hard to tell if Pendleton has actually modified himself or not. For now, I'm assuming the worst, which is that there's a lot of nano-tech in his body.

“Umm... I've got something to tell you.”

Just then the elevator doors opened. Gillian and Stewart walked out into the basement tunnel. It was actually quite fancy. When the hotel was operational this tunnel would connect PMTC to the hotel so that visitors could get from one to the other without going above ground.

Stewart continued, “Let's sit down a moment.”

He led Gillian over to a very nice wooden bench across from the elevator. He held her hand.

“Uh... the deal is... well, the deal is that I've enhanced myself quite a bit... with nano-technology. It's throughout my body. It filters the air I breathe. It protects me from disease. It gives me additional strength. It enhances my senses a certain amount.”

Gillian looked at Stewart. He appeared perfectly normal.

“Are you some kind of superman? I mean, beyond the way I think of you anyway?”

Stewart smiled at her kindness.

“No... I wish I was. Taking out Pendleton would be much easier if I was a superman.

“If he really is alive, and has adapted this technology, then he's probably perverted it in ways I haven't wanted to

imagine. That's why I keep this stuff secret until I've worked out most of the ramifications. It seemed the responsible thing to do. I generally work out one system – you know, debug the whole thing – and then add it to myself. Complex systems like this interact in strange ways. I can also remove systems from myself, although I have to admit, I get used to feeling really good, and I don't feel as good when a system is removed. Plus there are issues with the microwave communication systems that drive the whole thing – I'm a little walking microwave radiation system.

“Don't worry about the microwaves – the effect falls off quickly, with the square of the distance, and the levels are quite small. A microwave oven is in the hundreds of watts range, and my little companions are communicating with milli-watts of energy. Still, it adds up, and I have spent a lot of time making sure that random microwave energy in the environment doesn't cause all this hardware in me to go haywire.”

Gillian needed time to think. “Okay, stop for a minute.” She stared into space.

There were too many questions. Had she just been making love to a machine? What was real? How could Stewart trust this stuff when it could so easily go wrong?

Gillian asked, “Just how fake are you?”

“I'm still me, the same person as always. This stuff doesn't think for me. I'm not a machine. In principle, it's no different from a person that is on antibiotics. The potential to integrate this kind of technology into people's

bodies and have the nano-machines hunt down, for instance, cancerous cells, is huge.

“The potential for abuse is also huge. If Pendleton wasn’t careful, and introduced a lot of these kinds of systems into his body, and, you know, ‘turned up the juice’ on them, then who knows what’s going on with him? I can imagine that if these systems were introduced to a person’s body without a lot of mental discipline, the good feelings would become a narcotic and isolate the person from his true feelings.”

Gillian touched him on the arm. “Is this your arm, or a machine, or a hybrid, or what?”

“It’s my arm. The enhancements, as I said, are really like antibiotics in me. But I have done some simulations where I really cranked up the amount of integration, and some fairly incredible things are possible. That’s why I am afraid Pendleton might have survived that crash. In fact, he might have even caused the crash, figuring he would survive it. I don’t know. I don’t know how much he understands of what he might have done to himself. Maybe the pilot knew that Pendleton was crazy and dangerous and blew up the helicopter to save us. Maybe he succeeded and there is nothing to worry about.”

Gillian had made up her mind. She told Stewart firmly, “I know you are you, and I trust you, and I wish you would trust me more with your secrets. I would feel a lot better if I felt I really knew you – all of you. And we do have additional technology we can apply to these kinds of things that keep secret intellectual property both more secure and also more traceable in case of a leak. And I

think if you're going to do things like this to your body I have *some* kind of a right to know, since I interact with your body on a rather personal level. But the fact is that right now we need to know what is going on. Is Pendleton alive? Is he causing more mischief? Let's get going and find out."

Bill turned to face Gillian. "You know, maybe you should stay here while I go across..."

Gillian cut him off. "Don't give me that dominant male hero crap. You're a scientist, not a super-hero. Let's get going."

Gillian got up to leave. Bill got up and followed her. Stewart smiled to himself and wondered how he ever got to be so lucky as to meet and fall in love with this amazing woman.

And in spite of all the weird things he did, she apparently loved him back.

He walked a little faster and caught up with Gillian.

"Let's go see what's what."

And then a new alarm was heard shrieking in the distance.

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The alarm caused Gillian and Stewart to stop. Stewart was staring off into space. After a moment his attention returned.

"Pendleton is definitely alive. He's entered the compound."

"How do you know that?"

“Ah, Gillian, there is one more thing I want to tell you about my enhancements. This is the last thing, I promise. I mentioned that I spent a fair amount of time managing the microwave emissions from the nano-machines. Well, the flip side is that I’ve spent a fair amount of time worrying about *incoming* microwave emissions –for instance, the kind that wireless networks use. We all use the same radio spectrum because it’s unlicensed for small distances. So one of the things I did was allow myself to hook into local 802.11 wireless networks. When I say I allowed myself to hook in, I mean that I allowed *my self*, my actual self, through the nano-tech in my body, to hook into various local networks.

“At first I did it so I could measure the power output of microwave energy in my immediate vicinity – I really just wanted to know the intensities that might be affecting my nano-machines but later I realized with a little programming I could connect right into the network without any extra hardware, just by using what was already in my body. Well, that’s what I’m using now.

“I just connected to the PMTC network and looked at some security footage from the helicopter crash. Pendleton is definitely alive and doing all kinds of damage.”

Bill’s attention drifted away for a moment again. Gillian presumed he was connected to the wireless network. She was dying to know how it worked – did he have a heads-up display of a terminal screen projected into his visual cortex? How much control did he have? How much concentration did it take? Gillian spent so much time

on the web that Bill's always-on connectivity sounded pretty cool, in spite of her misgivings about nano-tech.

Bill's attention returned. "We might have a very big problem. A very, very big problem. A bigger problem than I could have imagined."

"How big?"

"Really big. I think Pendleton has integrated an experimental power system into his body. I'm basing this on what I'm seeing him do to the security cameras. It's very powerful. I personally never integrated anything like it into myself – I only ran simulations – it's very dangerous. Pendleton probably doesn't really understand the ramifications of what he's doing. And he's probably high as a kite on an energy rush that is like ten times cocaine. I doubt he has the mental discipline to control it. In fact, I know he doesn't. He's going to go in there and dissolve some things and blast other things and pretty much trash the place."

Stewart tuned out for a moment. "Ah, I see some people getting out onto the surface through the emergency exits. That's good."

Stewart turned to look at Gillian but his eyes were unfocused. There was a minute of silence.

Stewart continued talking. "There might be one additional problem, though, beyond the problem of Pendleton trashing the place. If he isn't careful, and he interacts with the wrong nano-machines in one of the labs, he could start a positive feedback cycle just like the one that killed Smythe. This stuff just isn't fully debugged yet and there are going to be unfortunate interactions between

nano-machines. Pendleton is an idiot to think he can control this stuff.

“If Pendleton creates a positive feedback cycle of sufficient size it will be an ecological disaster. It could be a meltdown.

“And this is a bad place to have that kind of meltdown. This island was formed by volcanic activity, and if the meltdown hits a big underground vent, we’ll be looking at a Krakatoa-sized explosion and a mini-nuclear winter here in the islands until the dust dissipates. It depends what that fool does.

“Crap. I wish he’d accidentally kill himself or overload himself or otherwise wear himself down. But he might do a lot of damage before that happens.

“We have to stop him. We have to go into PMTC and figure out a way to disable him. And we have to hurry it up.”

Stewart’s eyes focused on Gillian. She realized he hadn’t been connected into the wireless network the last couple of minutes – he’d just been thinking, imagining various scenarios while he talked out loud.

Gillian asked, “So what are we waiting for?”

Stewart replied, “We’re waiting for me to shut down all the central computer systems.” His eyes defocused once again, but this time just for a moment. “Alright, I’ve started the shutdown sequence. It takes about a minute for the computers to save everything out and then shut themselves down. Let’s get going.”

Bobby Lightener lay in a pool of blood on the floor. Pendleton had made quick work of him. He surveyed the security equipment and the rows of surveillance monitors. He noticed most of the staff had evacuated from PMTC and was up on the surface. There were a few stragglers who would be up shortly. He wondered where Bill Stewart and the insurance lady were hiding. He couldn't see them on the surface.

Just as Pendleton began a more methodical search of each monitor, hoping to get a glimpse of Stewart or the insurance lady, the monitors began winking off. Stewart must have gotten to a network connection and given the shutdown sequence. It was no biggie. Stewart would eventually try to get to his private lab, so Pendleton didn't really need to find him on the monitors. Pendleton knew he would catch up to Stewart soon enough. But first he had a little homework to do.

Pendleton eased out of the security booth and then ran at a sprint down the yellow hall to the demonstration lab. He entered the demonstration room where he had lost the skin off his arm. The equipment was still set up and ready to go.

Pendleton wired together the machines so that a positive feedback cycle was inevitable. Then he programmed the machines to turn on in an hour. If Pendleton didn't succeed in his mission to kill Bill Stewart and that stupid insurance lady, then a good part of the island they were on would be destroyed.

Pendleton would be happy to have revenge, even in death.

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Gillian and Stewart ran down the passage way toward PMTC. As they approached the doorway to PMTC the smell of burning debris became stronger and stronger. Burnt plastic had an evil stench to it.

“Our goal is to get to my private lab and get a special gun I invented. It shoots a strong blast of microwave energy which will disable the communication between nano-machines. Since Pendleton can blast just about anything he wants with that crazy energy system of his, we’ll need something really strong to stop him. I’ve always worried that something could go really wrong with my systems, so I invented this gun to use in an emergency. I figured I could just blast a nano-machine system with it if things were really screwed up. This situation certainly qualifies! The microwave energy will melt the circuitry in the nano-machines. It’s not too healthy for human cells, either, so we need to be careful where we point it.”

They ran up a stairway to the central hub of PMTC and then Stewart began to sprint down the hall toward his private lab. Gillian followed close behind. They arrived at the lab slightly out of breath. Stewart waved his hands across a seemingly blank portion of the hallway in a strange sweeping pattern, just as Pendleton had done with his own private lair earlier.

“Stay close. The door won’t stay open long.”

A portion of the hallway wall dissolved. Gillian and Stewart entered and the door closed immediately after them.

“Luckily I shut the cameras down, so Pendleton couldn’t see the pattern I’m made on the door. We should be somewhat secure in here, depending on how much Pendleton knows about my lab.”

Stewart’s private lab was immaculate. It also appeared to be quite empty. But Gillian quickly saw that what looked like empty workbenches were in fact nanotech devices that kept everything hidden away from sight. Stewart waved his hands over different portions of his workbench which resulted in parts of it dissolving and then being replaced with bits of equipment that emerged from the workbench.

Stewart grabbed four different items that had come up from the workbench and quickly assembled them together into a rifle. First he screwed the barrel onto the grip and then attached the stock. The stock was quite heavy – it consisted of a very large battery. The “barrel” was a series of small dish antennas which focused a beam from the central part of the gun. Finally he attached a laser-sight.

“You turn the gun on here,” he said, as he pointed to a switch on the side of the grip, “and when it is on, a ruby-red laser sight is activated – otherwise you wouldn’t have any idea where the microwave energy is going to go since microwave energy is invisible. It’s the same microwave frequency as our wireless network, which is the same as a microwave oven, and the same as many portable phones.

There's just a lot more of it coming out of this gun, and it's very focused, and very powerful. Fire in short bursts otherwise you will drain the battery very quickly. The gun will make a repeating tone while the trigger is pulled, so you know when it's firing."

"Why are you telling me this? Aren't you going to have the gun?"

"Sure, but just in case. And if you have a chance to fire it at Pendleton, don't hesitate. He's very powerful right now and I very much doubt he will hesitate if he has a chance to kill *you*."

– 47 –

Pendleton was at the center hub when he stopped to consider his options. His original plan, all shot to hell, had been to steal Stewart's technology, destroy Stewart's company, and then in a couple of years resurface with the technology and claim it as his own. He still had a copy of Stewart's product database, and he still planned to destroy Stewart's company – and hopefully Stewart too – but he wasn't too sure there was a way to survive and then resurface later with the technology. He could go on a suicide mission and be pretty sure of killing Stewart and the insurance lady.

Or he could spend a little more time planning his escape. While he was a little depressed his plans hadn't worked out the way he wanted, he had to admit to himself his nano-tech body felt *good*. He liked feeling good. It had been a fairly rare occurrence in his life and it took some

getting used to. But the sense of power and control was growing on him.

So Pendleton started planning a way to kill Stewart and escape. There were enough goodies in the various labs that he should be able to come up with something.

But first he headed back to the product demonstration lab so he could reset the timers and put the machines under his personal control. No point in having the place meltdown just as he was about to escape.

Pendleton turned around and headed back to the product lab.

– 48 –

“How are we going to find Pendleton,” Gillian asked.

“I’m going to have to turn the security cameras on for short bursts of time, so I can track where he is. Hopefully he’s busy looking for us, and won’t notice.”

Stewart stared into space a moment.

“He’s heading down corridor Yellow – the research labs. Let’s go get him.”

– 49 –

Pendleton looked at the two nano-machines that were set to meltdown. The computer continued to count down the time – 50 minutes left to meltdown. How could he trigger this thing remotely? Stewart had control of the computer network. He could extend the time limit and

hope he took care of everything before time ran out. It was unlikely that anyone would think to look in this lab. Pendleton set the timer for an additional hour. It would have to do.

As Pendleton turned around, he was surprised to see the door to the product lab swing open. Standing right in front of him was a special gift – Bill Stewart and Gillian. Pendleton raised his arm and let blast a stream of energy particles.

Stewart pushed Gillian out of the way and then jumped himself but he wasn't fast enough and the stream hit him in the arm. His arm twitched out of control as the energy was absorbed by his own nano-skin. He dropped the gun. After a moment his arm re-stabilized but unfortunately the gun was on the other side of the door.

“Run Gillian!”

Stewart dove across the open doorway toward the gun. As he did so another blast of particles from Pendleton grazed his leg, which began twitching out of control. Stewart grabbed the gun and aimed it at the open doorway.

Pendleton had seen the gun and didn't want to find out what it was, so he hung back in the lab. Stewart was on the left side of the doorway and insurance lady was on the right side.

As Pendleton looked out the doorway and considered how to kill one or both of them, he noticed a red laser beam focused on the door jam. That was convenient – the laser pointed directly back to Stewart whom he knew was holding the gun.

The red laser sight started to move and then disappeared behind the left side of the doorway. Stewart had realized that he didn't need a line of sight shot to get Pendleton. The microwave energy would go right through the wall. Stewart started firing off pot shots through the wall. Pendleton had no idea what was going on – a beeping sound like a Star Trek phaser was audible out in the hallway, but nothing was happening. There were no impacts from bullets or a laser or anything.

Suddenly Pendleton felt a terrible burning across his thighs. He looked down to see his skin peeling open. Fuck! Stewart must be firing microwaves at him!

Pendleton didn't have time to wait for Stewart to keep firing random microwave bursts throughout the lab. Pendleton jumped forward toward the open doorway and did a roll out into the hallway. As he slid out into the hallway he rotated slightly so his arms were pointing toward Stewart and let go with all the energy particles he could muster. At the same time Stewart took aim at Pendleton with his microwave gun but nothing happened. The batteries were dead.

Pendleton's blast caught Stewart full on. Stewart's entire body erupted in spasms. The damage was severe – Stewart's body was twitching and bouncing in the hallway. After a moment it stopped and lay still. Pendleton rolled over to look for the insurance lady but there was no sign of her.

Pendleton's legs hurt like a son-of-a-bitch. He placed both of his hands over the wounds and built another layer of skin on top, which at least stopped the bleeding.

Unfortunately this new layer of skin wasn't "smart" skin, so all it did was stop the bleeding. Pendleton's legs hurt like hell and were only working half speed. Pendleton struggled up and then headed off.

– 50 –

Gillian was hiding in the central hub behind the counter in the cafeteria. She had been looking down the hall when Pendleton had let go with the huge stream of particles. It looked like he had killed Stewart, and Stewart was covered in smart skin. A shot like that would kill her instantly.

Gillian calmed her breathing and tried to listen for any kind of clue as to what was happening. She heard Pendleton approaching from down the hall.

Instead of searching for Gillian, as she expected him to, Pendleton headed off down hallway purple toward the demonstration rooms. Why would he do that? He was up to something bad, she was sure of that. But first Gillian had to check on Bill. She ran down the yellow corridor as quietly as possible.

Bill was prone on the floor, not moving, but breathing shallowly. She put her face next to his.

"Oh, Bill."

"Gillian... "

"Bill, don't talk now. I'll carry you top side."

"No, get Pendleton..."

Gillian leaned in close. "I can't lose you again."

"... won't die... just stuck... get Pendleton..."

Gillian looked around for the gun. It was a couple of feet from Stewart. She reached over and picked it up.

“No...,” Stewart growled. He was having trouble pushing the air from his lungs. “Batteries dead.”

Gillian held onto the gun. “What can I do? He’s too powerful.”

Stewart slowly inhaled and then worked hard to push out a breath. He said, “Microwaves.”

Then he fainted and his head rolled to the side.

Gillian felt for Stewart’s pulse. It was present but very light. She needed to get him to the surface. It seemed much better to her to run for it than for her to try to stop Pendleton. He would just kill her.

Gillian grabbed Stewart by the arms and hoisted him up into a fireman’s carry. It took all of her energy to get him up and start walking. She struggled down the hall toward the hub. With each step her legs were burning from the effort. She was almost to the hub when she realized she didn’t have the strength to get Stewart out of the underground complex.

She gently lowered Stewart and then sat down next to him. She looked at his face, which was quite serene. He was so handsome. And so smart. If their roles were reversed, what would he do?

Gillian felt so drained. If only there was some way to lift Stewart. With all the gadgets around, there must be something that could lighten the load.

And then she had it.

Wings.

She could fly him out.

Gillian stood up and entered the hub, and then walked over to the purple corridor. She peeked down the corridor. There was no sign of Pendleton. The wings were in the test cavern at the end of that corridor. Pendleton had gone down that corridor. The last person she could afford to see was Pendleton. He was too strong.

But she would have to risk it. All of the communications and computers inside PMTC were shut down. There was no way to get help. If she could get some wings on Stewart, then she could guide him down the hallway that led back to the hotel, and get help from there.

Gillian went back to Stewart and kissed him gently on the forehead.

“I’ll be back.”

Gillian took the microwave gun and dropped it behind the counter of the security desk, then headed off down the purple hallway toward the flight test center.

– 51 –

Pendleton thought about hiding somewhere until PMTC melted down and all of his worries would be over. The initial rush of power was over and he simply felt wired. He had killed or at least immobilized Bill Stewart. Insurance Lady was still on the loose but her physical strength was minuscule compared to his power. The inside of PMTC had been evacuated.

Pendleton made it to the end of the purple hallway and came to the door that led to the flight test area.

“Shit, why not?” he thought to himself. He needed time to think and he couldn’t think of any good reason why

he shouldn't be flying while he was thinking. Pendleton walked over to the rack of wings and picked one at random. Pendleton felt a little charge of excitement. Nano-tech was cool! Then his excitement turned to frustration. Why couldn't things work out for him for a change? Why did guys like Stewart have it so easy?

Was there such a thing as karma? Pendleton sure hoped not. Pendleton was pretty sure this life was all there was. He'd been convinced of that since he first learned to program a computer. People were just programs designed to search for pleasure. Some people called it "wet-ware." "Wet", indeed.

Pendleton considered his position. What was pleasure anyway? It sure as hell wasn't frustration. And yet Pendleton had known people, like Smythe, who could hammer on a problem with infinite patience. It was almost like the guy liked tedium.

If Pendleton hadn't started hacking computers in high school he would have been bored out of his skull. The feedback was much more immediate. It was so much easier to program in a higher grade than to do all that tedious homework! His fellow students spent hours at night doing miserable tedious homework. He thought they were losers.

Then there were the guys like Stewart – the super smart people in class who didn't appear to do any homework. They seemed to just "get it." Pendleton felt he was in that class of student ... except not quite. So he faked it by hacking. As time went on he started to believe his own bullshit.

But to Pendleton it wasn't bullshit – his excellent grades, whether earned or not, proved that he was in control. He 'got' good grades and that was good enough. He outsmarted the system – what was smarter than that?

Pendleton finished putting on the wings and floated up from the floor. He started lazily tracing figure-8 shapes over the floor. After each one he pulled up a couple of feet higher. He kept daydreaming about how unfair life was for him.

Soon he was close to the ceiling. He began flying patterns in and out and around the light fixtures in the ceiling. Pendleton was good at flying. He distracted himself from his thoughts by doing some acrobatic maneuvers.

As a warm up exercise, he flew down toward the floor at high speed and pulled up at the last second. Then he flew straight at a wall and stopped within an inch of it. Then he flew to the other wall. At the last moment he pulled up his feet, hit the wall, pushed off, and did a back flip in the air. He was starting to enjoy himself. But not enough to consider stopping the meltdown sequence.

The thought of his imminent death had brought a great sense of peace to Pendleton. Soon his troubles would be over.

Pendleton flew up to the ceiling and considered which stunt he should do next.

And then a miracle happened.

The door to the flight test center opened and Insurance Lady walked into the room.

Pendleton watched in fascination.

Insurance Lady never thought of looking up. Pendleton felt blessed – not by God, because he didn't believe in God, but by circumstances.

Insurance Lady went over to the rack of wings and selected a pair and struggled into it.

Then, strangely, she picked up another pair of wings and held onto them.

She lifted off the ground. With great hesitation, she started to fly forward, just one foot off the ground.

Pendleton had stayed deadly still – he didn't want any change in sound or in the shadows that played on the walls to give his presence away. He was filled with curiosity – what did that crazy bitch think she was going to do now?

Pendleton silently laughed to himself. Insurance Lady showed a distinct lack of comfort as she floated slowly toward the door. He considered flying down and kicking her in the head. He was so strong she would never survive it. He could tear her head right off.

Or he could hover above her and suck the life right out of her body. That would be entertaining.

Or he could follow her and see what she thought she was doing.

So he did.

– 53 –

Gillian had the second set of wings and so far hadn't run into Pendleton. Maybe he had doubled back and headed out the exit. Or maybe he was in one of the product demonstration rooms rigging up some horrible mischief.

Gillian floated down the hall toward the central hub. She had a creepy feeling. She felt she was being watched but whenever she looked back there was nothing there.

She entered the central hub and then turned toward the yellow corridor to find Bill.

As soon as she entered the hallway she saw something was wrong.

Bill wasn't there.

Maybe he had crawled into the R&D lab.

Gillian continued down the hall. She dare not call out his name – Pendleton might hear it. She floated silently down the hall. She came up to the room where the battle with Pendleton had taken place. The door was open but there was no sign of Bill Stewart. The microwave gun was on the floor of the lab.

Scratched onto a sheet of paper was a two word note:
“Convention Center.”

– 54 –

Pendleton considered his next move. He was hiding behind the contoured desk in the security center. He had taken a peek once Insurance Lady had started down the yellow corridor and could see that Stewart had managed to run off somewhere. Or worse, perhaps he had gone in to

the R&D lab and shut down his most-excellent grade-A feedback loop.

Pendleton peered through a crack in the desk and watched Insurance Lady emerge from the room and enter the hallway. That meant Stewart wasn't in there. Gillian still carried the second set of wings.

And then it dawned on Pendleton what the second pair of wings was for – they were for Stewart. She was a tricky one, that insurance lady.

Pendleton wanted desperately to kill Gillian but now he knew that keeping her alive would lead him to Stewart. It would be much more satisfying to kill them both in person rather than to let the ecological disaster do the job.

He watched Gillian go downstairs to the tunnel that connected to the new hotel.

Stewart must be at the hotel.

Excellent!

Pendleton waited a few minutes and then floated down the stairs.

– 55 –

Gillian thought it was clever of Bill Stewart to hide at the hotel. Maybe Pendleton would think 'laterally' rather than 'vertically' and never think to go downstairs to the tunnel.

She was almost to the end of the tunnel and to the elevators at the hotel when the hairs on the back of her neck stood up. She felt she was being watched but when she quickly turned around there was nothing there. She steeled herself to keep to the plan.

She tapped 'Up' at the elevator. The elevators each had a certain 'home' floor, where they would go when there was no one calling them. One elevator was on the first floor, another was on the fifth floor, another on the ninth floor, and so on.

Gillian's elevator arrived very quickly. She entered and hit the floor for the convention center – the fourth floor. After the elevator dropped her at the fourth floor she headed down the hall to a sky bridge that connected to the unfinished convention center.

As she walked across she marveled that the sands of Anegada remained relatively untainted by the battle that had been ensuing beneath the surface. She could see the helipad that was covered in debris. She saw groups of PMTC employees grouping together near the ocean where the breeze would keep them cool. It seemed so peaceful.

She entered the main mezzanine for the convention center and looked out over the seats. She started to float down the steps. The Convention Center was a dual use sports and exposition center. Right now the floor was set up for basketball and the seats were in a stadium configuration. She couldn't see Bill but she spotted his laptop in the center of the basketball court in the middle of the jump ball circle. She would be sure to see the laptop no matter which entrance she used.

She was halfway down the steps when she paused.

Gillian realized that she didn't know for certain that Bill had written the note.

Or that Bill had placed his laptop in the middle of the convention center floor.

The hair on the back of her neck rose up again.

She twisted around to look behind her.

There was Pendleton floating at the top of the stairs grinning.

“Hello, Insurance Lady,” Pendleton said in a conversational tone.

Then Pendleton raised his voice and shouted, “Oh Bill, Oh Bill! Come out, come out wherever you are!”

Gillian quickly decided that Pendleton didn’t know any more about the laptop than she did. She used her last chance to fly as fast as she could toward the laptop.

She was almost to it and she could see a message on the screen when a stream of particles from Pendleton fried it.

She slowed and then turned to face him.

“Bill’s not here and you just fried any chance of talking to him.”

– 56 –

“Oh really, is that so?” Pendleton said as he floated down toward Gillian.

“Yes. He has body enhancements too. One of them allows him to tap into Wi-Fi connections. That laptop had a Wi-Fi connection. I was going to talk to him on it. But you fried it. I don’t know where he is and now there’s no way you’ll know either.”

Pendleton grinned. “I think he’ll be here soon enough. You’re here, so he’ll be here. Why don’t you just settle yourself down on the floor there and remove those

wings. I don't want to have to worry about you flitting off somewhere."

Gillian did as he asked. As she descended she flew as close as possible to where the laptop sat fried on the floor.

Gillian had been close enough to read the message left by Bill on the laptop. A word processor had been opened up and a message in large, 28pt type had been left for her. It was a very simple message.

It said,

**“Whatever you do, don’t
move.”**

And now thanks to Pendleton's sharp-shooting, she was confident that Pendleton would never see the message.

All she had to do was stay alive, kill time and wait for the cavalry to arrive.

– 57 –

Stewart was up in the rafters. He hurt like a son-of-a-bitch.

He needed Pendleton to get as close to Gillian as possible.

He needed him in the center of the convention center. The center of the floor was the focal point.

– 58 –

Gillian looked at Pendleton. He looked back. She had removed her wings. Both sets of wings: hers, and the ones she had brought for Stewart, lay delicately on the floor.

They continued to stare at each other. Once again Pendleton mentally ticked off his options.

He so desperately wanted to kill someone. Gillian was good bait, but mightn't she be just as good dead as alive?

No, if she was alive she could scream. Live bait was better.

Pendleton flew down next to Gillian.

Gillian didn't dare move.

Pendleton reached out a hand and started to dig his thumb into Gillian's collar bone.

Gillian wanted to scream but even more she wanted to stay still as Bill had asked her to do.

The pain was getting stronger. She winced. Pendleton smiled.

– 59 –

A horrible scream broke the silence. It echoed back and forth in the big open space.

Gillian felt the pressure on her collar bone relax.

Pendleton was screaming. He tried to hit Gillian but his arm wouldn't move. He dropped the control tube for his wings and it clattered to the floor.

He tried to flail as the wings dropped him on the floor.

The scream stopped and Pendleton gulped down some air.

He looked very confused.

It was silent for a moment.

The silence was broken by another scream.

“Run!”

– 60 –

Gillian ran. She ran away from the confused, twitching form in front of her.

Pendleton wanted to give chase but he couldn't.

He continued to twitch and lost his balance. His entire body was in spasm. After a moment the twitching subsided.

“What the f-,” he whispered to himself. He felt himself returning to normal.

That bitch the insurance lady was already half way up the aisle and running to the exit.

Pendleton got back on his feet.

That's when Stewart hit him with the second blast of microwaves.

Pendleton exploded into a million pieces. Blood and brain and organs and bits of bone flew everywhere in a 20 foot radius. The air was red with blood that had been converted to vapor. The sound of the explosion echoed back throughout the hall.

The red cloud slowly dissipated. The remains of Pendleton consisted of nothing but a big disgusting circle

of blood and gore in the center of the floor of the Convention Center.

– 61 –

The clap of sound from the explosion caused Gillian to turn. She had trouble understanding what she was seeing – a red cloud that was slowly settling to the floor of the basketball court.

“It’s okay now.” It was the voice of Bill Stewart. She turned to see Bill struggling down a utility ladder. She ran to him.

“Is he dead?”

“He’s as dead as a person can be. He doesn’t exist anymore. And all of the nano-machines in his body are completely destroyed.”

Gillian buried her head in his shoulder.

“Ouch,” he said. He slowly lifted his arms and enveloped Gillian in them. They hugged tighter and tighter. Stewart felt Gillian’s tears on his shoulder.

“It’s all right. He’s really gone. We’re safe now.”

Gillian just hugged him tighter.

“I love you too,” he said, and smelled her hair, “but that hurts!”

“Love hurts sometimes,” she whispered back to him.

Gillian finally released Stewart and they both sat down in convention center seats. Gillian wiped the tears away.

Stewart looked away and then tried to secretly wipe away the wet spots in his eyes.

“Yes,” he said, “since you’re about to ask, I would love to tell you what happened.

“Pendleton did a pretty good job on me. I was frozen, unable to move, for a good ten minutes. I was quite worried he was going to come back before I could do anything. Fortunately he seemed more interested in finding you.”

“So I became bait again.”

“Yes, but like you said, in a battle situation, a person has to make decisions fast, and I didn’t see too much alternative. Either you would find my note and lead him here or he would find the note and end up here anyway. Of course, if he had come on his own, I would have had to quickly and remotely remove the message I left for you from the laptop.”

“Why couldn’t I move? And aren’t you proud of me? That hurt pretty bad.”

“Well, you could have moved a little, but yes, I am very proud of you. What I really needed was for Pendleton to be as close to the center of the basketball court as possible. If he had tried to *really* hurt you from a distance I would have tried to fry him anyway. He’s much more susceptible to microwaves than you are, especially a big pulse.”

“What microwaves?”

“I aligned all the Wi-Fi antennas in the stadium to point toward the center of the basketball court. When Pendleton was in the center hurting you I sent a small blast of microwave energy to disable him and then yelled at you to run. A little pulse of microwave energy like that won’t hurt biological tissue but it confuses the hell out of nano-machines! I yelled for you to run, because the second pulse wasn’t going to be as mild. In fact, I pretty much fried every Wi-Fi adaptor in here. I only had one shot left and I made the most of it. Fortunately, you were away from the center, so there was no need for me to hold back.

“Pendleton was vaporized as every nano-machine in his body went crazy and tried to go in a different direction. I’m glad you didn’t see the actual, uh, transformation.

“The worst thing that could have happened was if he had flown up and surveyed the place, because he would have been away from ground zero and likely to find me. But his ego kept him close to you, thank goodness.”

Gillian reflected on the near misses of the day and just felt enormously happy to be alive.

She let out a big sigh.

And then the floor started shaking.

– 63 –

“Shit!” Stewart yelled. “That asshole must have started up a positive feedback cycle! Let’s get back to PMTC before this whole place melts down.”

Gillian blinked. Wasn’t this ever going to end?

Stewart jumped up from his chair and instantly fell down. Gillian was instantly at his side.

“You have to help me move – I’m not stable enough to move as fast as we need to. We have to go back to the labs and disable whatever crap that asshole put together.”

Stewart got up more slowly and stretched out an arm. Gillian put it around her shoulders – and felt a bit of pain from where Pendleton had pinched her – but grabbed onto Stewart’s arm and together they started toward the exit.

The floor shook again and this time some light fixtures came crashing down around them. “I think we better hurry,” Stewart said.

They made it up the aisle and onto the mezzanine. Together they half walked and half ran toward the sky bridge.

Just as they were about to step onto it there was another rumbling and it collapsed. It fell inward from the center and hit the ground with a spectacular explosion of broken glass.

Bill and Gillian stared at the mess.

Bill said, “I guess it’s the stairs.”

They looked for and quickly found the stairs. It was tough going down the stairs as a couple. Eventually they fell into a rhythm where they both used the handrails and sort of hopped down each step.

“Thank goodness we’re going downstairs,” Gillian said.

“Going up is usually easier.”

“Do we need to discuss this right now?”

Bill looked at her. “Uh, no.”

The continued down the flight of stairs until they reached the basement.

Just as they left the stairwell the lights went out.

“I don’t suppose you have a flashlight built into you?”

“No, but I can see in the dark pretty well. You just keep going forward and I’ll steer us.”

Gillian pushed forward and hoped she wasn’t going to run into anything. They were halfway across the subterranean passageway connecting the hotel and PMTC when there was another rumble and the emergency lights came on.

“Hmm,” Bill said. “I guess sometimes if something isn’t working it’s a good idea to give it a kick, which the Earth just did to the lights.”

Gillian was pleased to see they were right in the middle of the hallway. She guessed Bill *could* see in the dark.

With the dim but helpful emergency lighting on they increased their speed down the hallway.

They were almost to the stairway back up to the central hub of PMTC when the lights went out again.

They kept their forward momentum going until Bill slowed them down before they hit the door. “Open the door. Now we get to see if going up is easier.”

Gillian withheld comment and felt around for the doorknob. She pulled the door open and the two struggled in and aimed for the stairs. Bill said, “Almost there – start feeling for the first step.”

Gillian lifted her foot higher than normally and probed for the step. As predicted, it was very close by her foot.

They were halfway up when the earth shook again – this time it shook so hard that Gillian lost her footing. Bill caught her around the waist and then let out a little “ouch” as he struggled to hold on to her. He would hate to lose his grip on her.

The lights flickered and they reestablished their walking pattern. It *was* easier going up the stairs – at least it was easier to coordinate their movement. Gillian’s thighs began to hurt. Bill kept grunting and Gillian assumed he was in pain.

They made it to the top of the stairs.

Gillian tried to open the door. The movement of the earth had moved the door frame enough that the door was stuck shut.

– 64 –

“Okay, superman, you’re going to have to open the door,” Gillian said.

“I can do it. The problem is bracing my feet – they hurt the most. I want you to grab me around the waist and help stabilize me.”

Gillian grabbed Bill around the waist and then put one foot against the stair railing. Bill pulled back on his arm and then let it fly. The door crumpled and then swung free.

They stepped out into the main hub of PMTC. They were hit with a blast of heat. The heat was pouring out of the purple hallway which glowed with a red sheen. The feedback cycle had consumed enough matter to hit a volcanic vent below the surface. There was the nauseating smell of sulfur in the air.

“We’re not going to be able to make it down that hallway. It’s too hot,” Gillian said.

“I’ll do it – my nano-tech skin will help me survive the heat. The question is, what will I do once I’m down there? I need a microwave source that I can use to disrupt as many nano-machines as possible and break the positive feedback cycle.”

“I stowed your microwave gun over there behind the security desk. We just need a power source for it.”

The room shook again from the unstable earth beneath it.

Bill said, “Gillian, you can move quickly without me. I need you to run to my lab and grab some batteries for the gun. You’re going to have to memorize a pattern to unlock the case that holds the batteries. Grab as many batteries as you can.”

Gillian focused on Bill. “Tell me the pattern.”

“First, trace three infinity symbols, one on top of the other. That ‘wakes up’ the pattern recognizer. Next, trace ‘h4x0r’ as one word. Then trace ‘open’ in Graffiti.”

“You use leet speak for your password?”

“Sure, it’s very old school. No one would think of it. Repeat back to me the leet for hacker.”

Gillian said, “hax0r.”

“No, that’s a different form. It’s ‘h4x0r’. Remember, it has two numbers in it. First, three infinity symbols, then ‘h4x0r’, then ‘open’, all lower case, in Graffiti. Got it?”

“I got it. Three infinity symbols, ‘h4x0r’, regular lower-case text, and ‘open’, all lower case, in Graffiti. Where do I enter it?”

“Anywhere on my work desk and the right compartment will open. Okay, go as fast as you can.”

Gillian gave Bill a quick kiss and took off running.

– 65 –

Gillian made it to Bill’s lab down the yellow corridor in less than a minute. The door was still open – thank goodness. She ran in and traced the pattern on the top of his work space.

Nothing happened.

She tried again. Three infinity symbols. ‘h4x0r’. Finally ‘open’ in Graffiti. Nothing. What was she doing wrong? Should she run back to Bill or keep trying?

She stopped and counted to ten. She thought about Bill and she thought about what he said and she decided to try again.

Three infinity symbols, one on top of the other. That seemed correct because the wake patterns behind the motion of her finger started to appear.

First part done.

Next, ‘h4x0r’. Hacker in leet speak with two numbers, not one.

She couldn't tell if it worked, but the surface was still making a wake pattern behind her finger, so it was still listening to her.

Finally, 'open', all lower case, in Graffiti. Graffiti was a writing system that was used to enter data into a Personal Digital Assistant when there was no keyboard – holographic or otherwise – available.

"Shit," she thought. There were different versions of Graffiti. Bill probably had used the 1.0 version because it was 'old school.'

Gillian racked her brain. There are had been at least ten versions of Graffiti over the years. She tried to remember back to college history class. They had learned the original Graffiti in that class. What was the difference? "O" and 'p' were simple and hadn't changed. Was it the 'e' or the 'n' or both?

Gillian tried tracing "OPEN" instead of "open" and a compartment flipped open. It was both characters that were meant to be traced in upper-case – in the old days people entered 'EN' instead of 'en'.

She grabbed four of the bulky batteries and took off in a run back to Stewart.

– 66 –

Bill had retrieved the gun from behind the counter and waited for Gillian. He looked down the purple hallway and saw a huge opening in the floor. Sulfur vented up from the hole. He was surprised that those nano-machines had survived the heat, but then he realized that Pendleton had designed them and that they were probably the same kind

of machines that had allowed Pendleton to not only survive the helicopter crash but to suck energy from it.

But how much heat could they withstand? A volcanic vent might be over 2,000 degrees Fahrenheit, though luckily the heat level dropped off fairly quickly. The helicopter crash had probably had an initial flash temperature of 15,000 degrees, but once the flames settled down, the temperature was probably about 1,500 degrees. And Pendleton had survived that. It was a bit of an open question as to how much heat these nano-machines could tolerate. Bill guessed they could withstand at least 1,500 degrees, because Pendleton had walked through the flames from the helicopter crash, but could they withstand 2,000 degrees? He doubted it, because in his own tests he had never managed to get any nano-machines to survive over 2,000 degrees.

It was possible that the machines were not headed straight down into the volcanic vent, but sideways across the cooler surface area. That wasn't as bad – that meant there wasn't really a chance of a *China Syndrome* meltdown, but it wasn't good either – it did mean that the nano-machines were introducing a lot of instability into foundation of the building.

He needed to kill a lot of machines and he needed to kill them fast. The microwave gun wasn't the right tool. But it was the only tool he had. When all you have is a hammer, he thought to himself, everything looks like a nail.

Bill was going to have to assume that the machines were spreading sideways but not down. Any machines that

fell into the vent would be destroyed by the heat – he hoped.

Gillian came back with the batteries. The stench of sulfur was overwhelming. Bill waved Gillian back down the yellow hallway a bit so they could breathe better.

“Did you have any problems getting the batteries?”

“No, no trouble at all.” This was no time to lecture Bill on the importance of being specific about the exact version of Graffiti he had wanted her to use.

“I need to convert the gun into a bomb. I’m going to hook all these batteries in series so I can generate as much power as possible, put it under the floor here, and set it off. I need to kill enough of Pendleton’s machines so that the surface becomes stable again. I don’t think they survive the 2,000 degree temperature of the volcanic vent – at any rate, I’m willing to risk that I don’t need to kill those machines.”

“What about the machines in your skin?” Gillian asked.

“If I set off the bomb, then I’ll be paralyzed, possibly permanently. So you’re going to set off the bomb. Worst case is you’ll get a little burn. I’ll be hiding in my lab behind a protective shield.”

The building shook again, as if to encourage them in their efforts.

Bill ripped a control panel off of the wall in the yellow hallway. He grabbed a bundle of wires and pulled them out. He used some of the wires to connect the batteries together and the others to bind the batteries to the gun. He ripped the barrel off the gun, thus removing the

microwave focusing system. The microwaves would scatter in all directions. He left two very long wires hanging – when connected, these two wires would complete the circuit to the batteries and the microwave bomb would ‘explode’. Gillian would cross the bare ends of the wires when it was time to set off the bomb.

“Let’s go,” he said. “Take a deep breath – I think you’re going to have to hold your breath for a couple of minutes.”

They both hyperventilated and then took one last big breath.

– 67 –

The air in the central hub had grown increasingly acrid. Gillian and Bill squinted to keep as much of the gas out of their eyes as possible. Bill handed a pair of wires to Gillian and said quietly into her ear, “Don’t touch these together until I say so.”

Bill half-ran / half-hobbled down the purple hall with the pair of wires trailing behind him. He suddenly dropped through the hole in the floor. Gillian couldn’t see what he was doing but when he reemerged the gun was gone. He must have placed it under the floor but above the foundation. He moved back toward Gillian as fast as he could.

He came up and whispered again into her ear, so as to use as little oxygen as possible, “Count to 30 and then connect the wires.” And then he half-ran to his lab.

Gillian began counting.

“One one-thousand. Two one-thousand. Three one-thousand...”

She could only hope that Bill would find some kind of shelter before she set off the bomb.

“Fifteen one-thousand. Sixteen one-thousand.”

Suddenly the floor below her began to shake, and the floor split open. She had to choose which side of the crack she should be on ... Bill’s side or the side of the volcanic vent? She stepped over the crack onto the side of the volcanic vent. As she did, the floor leapt up a foot, tossing her in the air. She let go of the wires as she fell.

She bounced against the floor and scrambled to find the wires. Where had she been in the count? She decided she didn’t care – Bill had better have found some protection, because everything was going to hell in a hand basket really fast. She grabbed the wires and connected them.

There was a short spark and then ...

Nothing happened.

– 68 –

Gillian waited for Bill’s return.

And waited.

And waited.

It seemed like hours but it was really just a couple of minutes, when Bill appeared out of the yellow hallway.

“Kind of anti-climatic, wouldn’t you say?”

She ran to hug him.

“Did it work?” she gasped.

“It worked well enough, I think. The shaking has stopped.”

“Were you safe?”

“Yes, I made it in plenty of time. I sort of lost track of time, and I was starting to wonder what was taking you so long to set off the bomb. It felt like time had stopped.”

“I think I only made it about 20 seconds before I set it off – see that crack over there? That moved the timing up a bit.”

She kissed him on the lips. There would be enough time for talking later.

– 69 –

Bill and Gillian were in the Board Room at PMTC. Six months had passed and things had returned to some kind of stability. The product line was scheduled for release in two weeks. A huge advertising campaign, using highly targeted Internet banner ads – that is to say, banner ads targeted at really rich people, had begun a few days ago. So far the buzz was building at an acceptable rate. Bill had been making the rounds on the podcast network telling everyone how great and fun nano-tech could be and should be and would be. Now he was back at PMTC taking a break.

PMTC had a new source of power – part of the process of rebuilding the facility had been to convert the volcanic vent into a thermal power source. The thermal vent now supplied 35% of PMTC’s power needs. Special cooling pipes had also been added that went out into the

deep ocean where the exit flow of water raised the temperature of the ocean ½ degree for about a thousand yards in any direction. Bill had an idea for making small fission reactions controlled by nano-tech machines and he had taken the opportunity to build for the future and put in the special cooling pipes.

Bill had made a deal with an undersea tourism company where he leased access to the area around the exit vent – because even a mere ½ degree of increase in the temperature of the water was enough to attract a lot of sea life to the area. Bill had also installed a dozen cameras around the water vent and now the video was piped into the PMTC network for anyone that wanted a real-time live video screensaver of the aquatic life.

The problem of what to do with criminals remained unresolved. Melissa Hathaway had assigned Gillian the task of coming up with a workable solution for dealing with criminals – something better than warehousing them. Clearly the approach that UFC had taken with Pendleton hadn't been adequate.

The passing of Charles Hathaway had been announced within the company to little effect. The “staff” was so independent they didn't really care too much who was in charge. Melissa, on the other hand, was very concerned with that problem, and the problem of succession. It was a problem that would occupy most of her attention going forward.

The surface of Anegada had been restored to its natural state. The twisted metal of the helicopter had been converted into a somewhat subtle shrine to honor those that

Pendleton had killed and also as a reminder to be ever vigilant.

The board of PMTC had been reshuffled. Stewart had encouraged the naysayers to cash out and move on to other ventures. The remaining board members had willingly bought them out.

The convention center would be completed in a month and in the meantime Gillian and Stewart had taken a number of “vacations” there in one of the nicer suites. Stewart had spent a week working on himself – destroying broken nano-machines, inserting new ones into his body, fine tuning, and when he was done, he looked none the worse for wear. Of course, Gillian would never look at him quite the same way again. And anytime he was distracted she would wonder – was he just thinking or surfing the Internet? Or both?

Bill had offered to outfit Gillian with the same machinery but so far she had passed on it. But she knew the day would come when she would start to feel a little less spritely and would be moving a little more slowly and then she would probably accept the “upgrades.” But she wanted to put that day off as long as possible if for no other reason than that Bill was constantly improving his machines and therefore reducing the risk of the “upgrades.”

So, until the next crisis, things were all right in Gillian’s world.

-- The End --

Deleted Material – A History of the Universal Fidelity Corporation (UFC)

The Universal Fidelity Corporation, as it came to be known, was the brainchild of Melissa Hanratty, a former sociology student from M.I.T. Melissa found sociology boring, and was about to drop out of school when she found herself in the dumbed-down statistics course that was required of sociology students. A whole new world opened up to her, where anything could happen to anyone at anytime, but in large groups of people, the same things kept happening over and over again. She was surprised to find out that statistics was really fun. She aced the statistics course, and then starting taking all kinds of optional math courses. She had never been a particularly good math student in high school and really didn't care for science much either. But before she knew it, she had graduated from M.I.T. with a major in math and a minor in computer science.

There weren't a lot of jobs for math majors, but one career that paid pretty well was the job of actuary. As soon as she graduated, Melissa got a job as an actuary at Occidental Insurance. An actuary is a person who computes mortality tables and the like. A mortality table basically just gives the odds that some percentage of people within a group will die within various time periods. Insurance rates are set based on these analyses, which is why the job generally pays pretty well, because it's not something you want to be wrong about. Of course, there turned out to be more to the job than just calculating tables.

For one thing, it was important to identify different groups of people. The easy ones, for instance, the smokers vs. the non-smokers had pretty much been figured out for years. Racial profiling, another way of defining groups, had been outlawed as discrimination... and in fact wasn't that useful anyway. It was more accurate to work off economic and other factors. Sometimes these things correlated to race but often they didn't ... so why take a narrow-minded approach and include race? The more accurately the insurance company defined a group, the more profitable it was to ensure that group, and the more profitable it was, the more cash the insurance company could horde, in case of a catastrophic payout (say, a big natural disaster).

When billions of dollars in premiums and potential payouts were at stake, even a 1% improvement in the definition of a group represented an increase in profitability of millions of dollars. Melissa found she was using what she had learned in one of her courses – Introduction to Social Ecology – a lot in her analysis of groups. So she returned to school and earned a Masters degree in Social Ecology.

Social Ecology is the study of people that pretty much treats them as if they were insects. Just as a more traditional scientist would classify and try to find describable behaviors for, say, various kinds of bugs, a social ecologist tries to find patterns and behaviors for people.

One principle of Social Ecology is the “Cost of Friction”, a concept discovered by Professor Howard Hayes, of the University of California, Irvine. Friction, of

course, was the resistance to motion when two objects were in contact. Without friction, everything would slide around bouncing off everything else. So, in Physics, friction was a good thing. When applied to Social Ecology, that is to say, to people, friction suddenly had a cost. That cost was measured in money. A physicist would say there is a cost to overcoming friction, namely that energy was converted to heat and dissipated. To a social ecologist, the cost of that energy was easily measured in dollars, by looking at the cost of transportation. Transportation systems existed to overcome friction for the benefit of people.

Melissa started to incorporate transportation models into her definition of insurance groups. By applying her theory, she managed a five percent savings for Occidental, which amounted to about \$50 million per year.

As a reward for her innovation, she was given a \$200,000 bonus that was considered quite generous.

Well, the way she figured it, this was \$50 million *per year* in savings for Occidental. And for that she received a one time payment of \$200,000? She had to admit it was a nice sum of money and she invested it right away. But \$200,000 for a \$50 million *per year* benefit to her employer? It didn't add up.

On the flip side, she was given increased respect and responsibility, and a longer vacation each year, and a better parking space, and everyone around her was jealous, so this must be some kind of progress ... but in ten years Occidental would be \$500 million ahead ... and she would be where?

And then a man named Ted Lewis wrote a book called “The Friction Free Economy”. She just happened across it while searching the Internet for friction and transportation references. Lewis’ thesis was that the Internet virtually eliminated the cost of friction – data (or if you prefer, knowledge), the primary product produced in the United States, could be delivered instantly for such a small sum of money that in many cases it wasn’t measurable. Lewis wrote during the famous “dot com” bubble at the turn of the century, and once the bubble burst, his book was forgotten by most.

But Lewis’ book got Melissa thinking again about the cost of friction and her bonus. After taxes, her bonus was about \$120,000. And then she realized something ... the \$80,000 that disappeared as taxes was *friction*. Her \$80,000 had dissipated just like *heat from friction*. What a waste!

And then she realized it wasn’t just taxes – everyone hated taxes, but most everyone paid them. There was more friction right before her eyes. Occidental was mostly friction. Everywhere she looked there was bureaucracy and friction. The economy was certainly not friction-free.

So she saw a problem ... but what to do? Keep working, of course, and think and think and think. But she wasn’t thinking about ways to save Occidental more money. She figured she’d earned her keep for the rest of her life, which according to the actuarial tables, would probably be another 60 years at least.

Well, most people have time but not money, or money but no time, but Melissa had both, because even though she had to go to work everyday and go through the motions, she had plenty of time to think. Thinking had the great benefit of being invisible to those around her, so she didn't have to worry about any stealing her ideas.

She wanted to start a new insurance company that had a lot less friction in it. She wanted to cut down on bureaucracy. But new insurance companies don't spring up like weeds – it takes many hundreds of millions of dollars to even get started. The odds can always turn against you and you might have to pay out a big pile o' cash before the company reaches critical mass and becomes self-sustaining. Where to get hundreds of millions of dollars?

The answer lay down next to her one day while she was relaxing on a beach on vacation. She was enjoying herself on an exclusive resort beach in the Bahamas. The man who settled himself down next to her was intent on picking her up, which he eventually succeeded in doing.

The man was Lord Charles Hathaway formerly of the British Parliament, and owner of a British insurance company, the General Reinsurance Corporation. And he was worth about two billion dollars.

In the United States, of course, billionaires are a dime a dozen, although only one, Warren Buffet, owned an insurance company. There are so many that nobody pays it much mind. But in Britain it is a major achievement to acquire even hundreds of millions of dollars, because the

economy is so screwed up. Lord Charles was of the opinion that it ought to be easier to make money in England. There ought to be as many billionaires *per capita* in Britain as the United States.

As the mating ritual proceeded over drinks, Lord Charles and Melissa began discussing business. Lord Charles was worried initially that all of the talk about business was going to ruin his chances of getting laid any time soon. The insurance business had become quite boring for him. But as time went on and they shared more and more of their exasperation at the “friction” of doing business, Lord Charles forgot about his original goal for the evening. Melissa changed his life – friction became his favorite word.

It was several weeks before Melissa allowed Lord Charles to experiment with a more personal kind of friction. The results were satisfactory and they began planning a long-term future.

Lord Charles had inherited his father’s insurance company. At the time, it catered mostly to industrial firms, providing on-the-job accident insurance. The business was fine – as fine as a British owned business could be – and Lord Charles was bored with it.

He knew there could be more adventure in the insurance business, because his father, Lord Hilbert, had saved the Apollo 13 moon flight from disaster. General Reinsurance Corporation had carried a liability policy on the manufacturer of a fuel pump that was used in the

Command Module. When that pump blew up unexpectedly in flight, the potential liability payout could have been huge, since people's lives were at stake. Lord Hilbert had flown straight out to the American company, Pumps and Technology, and supervised minimizing the damages and working with NASA to get the astronauts home. Ultimately General Reinsurance paid out about \$5 million in damages; but Lord Hilbert estimated he had saved his company about \$25 million in additional payouts by getting those men back alive.

Lord Charles didn't think insurance for space flights was the way to get excitement back into his life. He needed something to insure that was exciting but not life-threatening. Worrying about life or death policies got annoying after awhile.

Wouldn't it be fun to produce a movie or two? That might add some excitement to his life. People hardly ever died making movies. Lord Charles started moving in show business circles, spending more and more time in Hollywood. Even though billionaires were a dime a dozen in the US, a billion dollars still commanded some attention in Hollywood. He let it drop that he might be interested in funding a film production "if it was the right picture."

Scores of scripts piled up in his Hollywood office. He had his secretary, Sarah, read them all and then choose the best three. He read all three of those and then tossed them all down the stairs to see which one went the farthest. He picked up the designated script, and realized he was disappointed with his choice, so he went with the script that went the second farthest. Now he had "the right picture".

Lord Charles knew the average cost at that time of a feature film, sans marketing expenses, was \$28 million. So, he lowered the budget to \$24 million to encourage frugal behavior, and went shopping for talent. He had little choice but to go through the major talent agencies, ICM and CAA. He pitted one against the other to produce the best “package” – a complete set of talent, with the director, leading actors, and supporting actors. He avoided the big names for cost reasons. He reviewed the actors’ audition tapes. They were fine. It was all about the director. He chose a promising up-and-comer to direct, set himself as executive producer to avoid cost overruns, and hired a producer from a film he had enjoyed. And he was in the film business.

The film, “Behind the Stage”, was released through a small distributor. It won an award at the Sundance Festival, and eventually, with video rights sold off around the world, broke even.

Scripts continued to pile up. Lord Charles wasn’t interested in reading them, so he gave Sarah a new job as a script reader, declared her an associate producer, and gave her a raise. Then Lord Charles went back to England so no one would bother him.

While he was in England, he considered how to merge his insurance company with his new show business interests. There was a kind of insurance called “completion insurance” that film studios buy – if the director quits, or the talent quits, the completion insurance would refund the

studio's investment, or at least a good portion of it. The film itself (or rather, the "potential" film), was collateral, so the insurance company ended up owning a half-finished film. Lord Charles figured he could hire enough talent to fix up any film that a studio thought was good enough to have already green lighted, so his company started issuing completion insurance. Only one or two films each year required a payout.

The cost of producing films skyrocketed over the next few years. Studios started to call when they even suspected that important films were in trouble. James Cameron's *Titanic* was in danger of going the way of the real *Titanic* when Lord Charles assumed certain production duties and got the film released. He made a deal where Cameron's residual, or back-end payments, were signed over to his company, General Reinsurance. He made sure to give Cameron back a portion of the lost money as a token – it wasn't good to piss off talented guys like Cameron. In Hollywood, it was all about relationships.

Titanic was a huge hit, of course. Covering Cameron's ass was the most profitable business decision he ever made.

A few years later, Lord Charles decided to take a break from the movie-fixing biz and vacation in the Bahamas.

The first step in Lord Charles and Melissa's plan to remake the insurance industry was to sell off General Reinsurance Corporation. It would be nearly impossible to

remake that company into what they envisioned. All the rules and regulations and red-tape and stodgy employees who above all wanted to avoid change had to go. So they sold it slightly under the market rate for \$9 billion. After paying off the stockholders, Lord Charles and his new wife Melissa were left with about \$1.8 billion in various off-shore bank accounts.

Twenty years later, the new Universal Fidelity Corporation was the world's largest, largely unknown insurance company. It operated from various off-shore locations via a network of agents who did their best to avoid paying any taxes. The only way to do that, of course, was to make sure no one knew how much money you were really making, because if they had a clue, somebody's IRS-equivalent would come hunting you.

In some ways, UFC didn't really exist at all. There were only two employees, Lord Charles and Melissa, and they were the owners. All other relationships were contractual. The distributed nature of the company, and the fact that it didn't have skyscrapers proclaiming how great it was, kept it off the radar of the tax-hunting countries of the world.

UFC specialized in "reinsurance", which is insurance that insurance companies buy. Even insurance companies can have the breaks go against them, and so to insure against that, they buy "reinsurance", which protects them from catastrophic events. The World Trade Center terror attack, for example, stretched many insurance companies almost to the breaking point. Sometimes large companies also buy reinsurance, because they self-insure and the odds

can go against them too. So, for instance, Disneyland self-insured, because no one would give them insurance. As a result, Disneyland was one of the safest places on earth, because it couldn't afford for things to go wrong. In spite of that, there were accidents. And Disneyland management knew they could buy a lot of legal talent for the money they would otherwise have to pay an insurance company, who would just settle anyway. And they also knew that if they handled the settlement themselves, and settled quickly, they could generally get away with smaller settlements.

But what if something truly catastrophic happened at Disneyland? Even the vast resources of the Walt Disney Company might not be able to handle it. So Disneyland bought reinsurance with say, a \$200 million deductible. Disneyland self-insured up to \$200 million but if problems went beyond that, then the reinsurance company would get involved. The reinsurance cost about \$30 million a year. But it covered up to \$4 billion in damages – almost enough to rebuild the entire park from scratch and pay for the huge liability claims that would be levied by unhappy victims' families.

UFC handled the reinsurance for Disneyland, and an agent like Gillian and an expert staff were assigned full time to *risk assessment* – finding out what kind of problems might occur and finding ways to make sure those problems never happened. Terrorism and earthquakes were the two major concerns at Disneyland that could reach reinsurance proportions. The earthquake situation in California had been analyzed to death. For instance, a structure like Space Mountain, which was built on sand, had pylons that went

down underground several times the height of Space Mountain. Space Mountain wasn't going anywhere even in a Richter-9 quake.

Terrorism was a particularly difficult threat to insure against at an amusement park where the goal was to get people to forget their worries. Passing through metal detectors and getting searched took away from the magic.

UFC developed literally hundreds of non-invasive methods for scanning for weapons and tracking potential troublemakers at Disneyland and the other Disney resorts. It was a tough business requiring constant vigilance, and many insurance companies steered clear. UFC was very successful in that line of business.

UFC excelled in reinsurance for entertainment companies. Regular insurance companies hated entertainment companies ... how did you quantify what they did, what the risks were? How did you even set a price? Lord Charles, of course, was unafraid, because he had a pretty good working knowledge of how entertainment products were produced.

And Melissa made it even better. She realized that she could build a better model for insuring entertainment companies. There was friction, there was risk, there were groups (many of them, like the unions and guilds, who competed with each other and kept the other groups in check), and it could all be analyzed much more rigorously than the somewhat seat-of-the-pants approach her husband had used.

The business thrived. Word of mouth was the only advertising necessary. People who could afford their

services talked to other people with money, and the whole thing grew. Lord Charles and Melissa took some lessons from the terrorists they studied and structured their business as a series of cells. Each cell knew very little about the others, and was a truly independent business unit. This “divide and conquer” strategy kept them under the tax assessor’s radar.

These policies all came with strings attached. In a way, UFC was like a government agency, except for-profit. UFC issued regulations designed to minimize risk of loss, and if the insured didn’t go along, UFC was perfectly happy to cancel the policy. The insured party did go along, though, because UFC had such a great track record of improving work environments such that accidents rarely happened. UFC eventually started to cover other kinds of risk, merging their film completion insurance business with other kinds of businesses, ultimately providing all kinds of completion insurance, from video games to computer systems.

A short note from the author

I was reading *Cinefex* magazine and I misread a sentence in an article about a horror movie (I can't recall the name of the movie). I thought the sentence had the word "electroplasm" in it. It turns out there was no such word in the article – it was just ectoplasm - but that one misreading sparked the idea for this book.

I thought, "how cool would it be to make a horror story where the "ectoplasm" was nano-tech?" I started on the manuscript in mid 2001 and as I write this now it is late 2008.

The idea of an insurance company as a replacement for statist government came from a manuscript sent to me by Peter Bos, to whom I was introduced (via email) by Alvin Lowi, whom I met through the private Volitional Science email list which my wife "owns" and I administer, which is about the teachings of Andrew Galambos from whom my wife took courses for several years. I hope that someday Mr. Bos' manuscript is more widely distributed. I'm told he is working on a book.

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